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Journal OF THE AMERICAN DIETETIC ASSOCIATION

PUBLISHED BY THE AMERICAN DIETETIC ASSOCIATION

Improving Organizational Leadership — *Robert A. Luke*

Built-In Sanitation — *Walter F. Snyder*

Cooling Rates and Bacterial Growth in Broth and White Sauce — *Karla Longrée and James C. White*

Diet Therapy in the "Dumping Syndrome" — *Mark A. Hayes*

Energy Absorption of Pre-Adolescent Girls — *Ruth M. Patrick et al.*

Distribution of Calories in Children's Diets — *Ercel S. Eppright and Pearl P. Swanson*

Calcium and Phosphorus Utilization in Older Men — *Kate Daum et al.*

Our Responsibilities to the Dietetic Intern — *Ercel S. Eppright*

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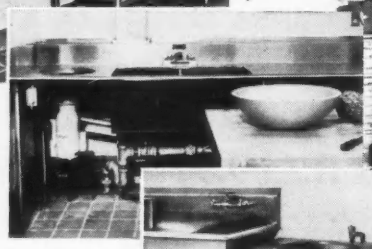

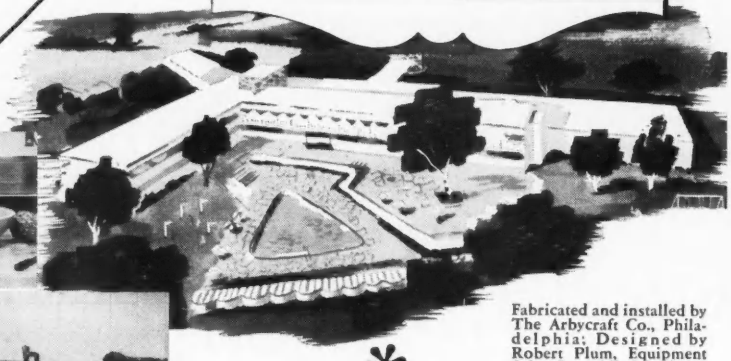

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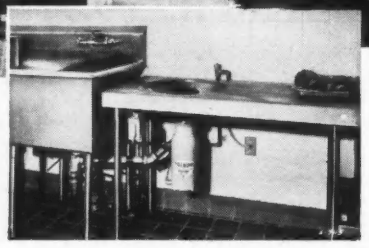

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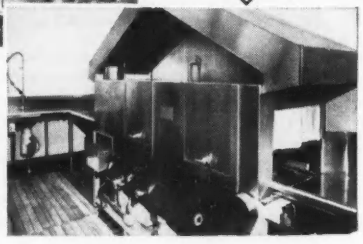

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Improving Organizational Leadership[1]

ROBERT A. LUKE

Assistant Director, Division of Adult Education Service, National Education Association, Washington, D. C.

If I were asked to answer the question, "What is the one best way in which the leadership patterns of a state dietetic association can be improved?" I would reply, "By building the various members of the state executive board into a strong, cohesive team."

If asked to give a second way, I would say, "By extending the team idea outward from the executive board to include every member."

Both of these answers have the benefit of considerable experience behind them. Both objectives can be met—but not automatically and not without effort. In performing these two tasks, i.e., building the executive board into a team and then enlarging the team to include all the members, common sense is not enough. It requires skill and practice as well.

CREATING A TEAM

As an introduction to the discussion of team building, it is important that we first look at some of the essential characteristics of "teamness." To build a team is not, as is sometimes stated, to create a situation in which there is no leader or "boss," in which there are no boundaries, and in which goals are uncertain since the members of the team cannot agree as to where they are going or why. Quite the contrary is true—as the briefest glance at the concept which holds a football team together will illustrate. The smoothly functioning team does have a leader, it does operate within a system of authority, each member has a separate and sometimes specialized task to perform, the goal is clearly identified, and progress toward or away from the goal can be measured quickly and readily.

What makes a team different from merely a group of individuals is the fact that the team shares a common history, endeavors to achieve common goals, has developed standards for work that are equally shared by all members, and has authority for decision-making vested in greater or lesser degree in all members rather than in a single individual. Described in these terms, "teamness" is something that we see frequently demonstrated and in which all of us have had a part at one time or another. I assume that all of us think of the operation that we are now carrying out, either in our job in the hospital, in industry, or in our own state association, as being a team operation. The task before us, then, is one of learning how we can be more self-conscious of these operations to improve and strengthen our teamness. Only in this way can we do an even more effective job of organizational leadership in the future than we have done in the past.

So that we will all have a common image of what we are talking about, let us in our imaginations, assemble a representative state executive board. We will want the president; the president-elect; the secretary; the treasurer; the section chairmen for community nutrition, diet therapy, food administration, and professional education; and several delegates. Now that we have these individuals assembled, let us ask each one several questions, the answers to which should represent the best possible approach to organizational leadership from the viewpoint of the member of the state executive board. First, let us ask the president what she thinks is the major leadership job of the president. (Preparing agenda? Setting the year's objectives? Reporting to the members?) Then, let us ask the section chairman for community nutrition what she sees as her major leadership responsibility. With that information, let us ask the section chairman for food administration what she thinks most presidents consider the section chairmen's major responsibilities. And, finally, we will ask the president-elect to state briefly what she thinks section chairmen, as a general rule, consider their major responsibilities.

From these "pretend" interviews, we can illustrate the thesis that "teamness" is the result of a conscious sharing of leadership roles and that there is an important initial specialization on the part of the president as a "procedural" leader.

[1] Presented before the meeting of officers, section chairmen, and delegates of state dietetic associations at the 37th Annual Meeting of The American Dietetic Association in Philadelphia, on October 25, 1954.

It is relatively easy for me to advise organizational leaders to share their leadership. It is equally easy for a physician to advise a patient to stop smoking or to get more rest, or for a swimming instructor to tell a beginner to relax in the water. The more difficult trick comes in influencing people to follow this advice.

Therefore, every state president has the right to ask me, "What are the one-two-three steps to be followed in building a team?"

HOW TO BUILD A TEAM

As the first step in getting a problem-solving or planning team warmed up and on the field, I think if I were a president, I might direct discussion to this question: "What are the activities we want accomplished at the end of our current term of office as a result of projects that could not possibly be consumated were it not for the existence of our state association?" Discussion by the executive board should be encouraged at this point to include a wide variety of alternatives—some practical, some presumably ideal. This kind of discussion is the "goal setting" part of organizational leadership. It is a basic first step. The *testing* of goals and objectives and setting of priorities come later. An effort made to telescope this first step of goal setting with practical testing may save a little time, but tends to limit initiative and inhibit imagination. It thus also operates as a brake on "permissiveness"—a term we will define a little later.

Step two in organizational leadership is the all-important task of diagnosis, i.e., the asking of the "why" question. Therefore, the second question to which, I, as president, might direct discussion in an executive board meeting of this kind is: "Why have we not already achieved this goal? What are the obstacles that account for our being where we now are instead of where we want to be?" Doing this kind of diagnostic thinking and discussing results in at least the following four advantages:

(a) It provides an opportunity for an empirical testing of the stated objectives.

(b) It identifies issues and brings them out into open discussion.

(c) It helps the leader set a pattern of candor and operates against excessive polite talk. Stated differently, the "diagnosis" of plans and projects is one way of building "permissiveness," a situation in which a person can freely express himself even though his suggestions are unpopular or seemingly "impractical."

(d) It sets the stage for the next two steps in systematic organizational leadership—the establishing of priorities and the working out of a step-by-step procedure for reaching the priority items in their proper sequence.

I will say nothing here about the method of setting priorities, other than to list it as the third step in organizational leadership.

Step four is spelling out in detail the steps to be followed in working out the plan. In this task, I hope all of you will ask, face, and answer the "five-dollar" questions and the "twenty-five-dollar" questions long before you ask, face, and try to answer the "sixty-four-dollar" questions. Each step—no matter how minor—in effective organizational planning should be written down, i.e., who does what when, and a final report made as each step is completed.

INVOLVING MEMBERS IN THE ORGANIZATION'S WORK

As we indicated earlier, there is another level of teamness that must be established—developing a sense of involvement and opportunity for participation between the state executive board and the members of the association itself and bridging the gap between the official actions of an elected executive committee and the desired action and interest of the large number of people who simply come to meetings, subscribe to publications, or pay dues is an exceedingly difficult problem. In my opinion, it cannot be accomplished to a very satisfactory extent through publications or through non-face-to-face activities, such as telephone committees, committees of correspondence, and other similar devices. The one great opportunity to involve individuals occurs at a meeting when they meet face-to-face.

This can be illustrated by the problem of making nominations for officers. At a business meeting, members may be organized into "buzz" groups for the purpose of determining the criteria that should be observed in nominating a person for each office of the state dietetic association. From the results and recommendations of these buzz groups, the nominating committee will gain both criteria and candidates for the slate it must formulate. Thus, as a result of group pressures and membership participation, high standards and qualifications for officers are established and candidate availability is suggested.

The American Dietetic Association and its affiliated state associations are dedicated to the strengthening and improving of individuals' way of living. I feel some kinship with the kind of work dietitians do because, in the long run, I think your work, like mine, is essentially that of adult education. When we use the opportunities of our association work on a local, state, or national level to find ways of involving people in making decisions that really count, we are working together in another great endeavor to help people continually grow and—the most important task of all—learn more about practicing the ways of democracy, the theory on which our government is founded.

Built-In Sanitation[1]

WALTER F. SNYDER

Executive Director, National Sanitation Foundation, Ann Arbor, Michigan

SUCCESSFUL programs of sanitation and cleanliness cannot be brought about merely by the expenditure of money.

In the food field, over 95 per cent of the food-poisoning outbreaks are still caused by failure of the human element, and not by lack of adequate, modern equipment. This focuses the spotlight directly upon the individual. We cannot build superior modern sanitation into the kitchen unless we also build it into the understanding and habits of people. And by "people," we mean not only the dishwasher or food handler, but also the top management of any institution, large or small, and the entire public of the community.

Too often the person responsible for food sanitation and food protection is doomed to at least partial failure unless he has the cooperation of top management of the institution he serves, and unless some appreciation of the value of modern sanitation exists throughout the entire community. The responsibility for adequate cleanliness and sanitation in a community is, therefore, not alone that of the official health agency, or of the supervisor of one particular food unit. It is the responsibility of all the people in the community—from the all-important housewife and the dietitian of a small hospital or food-service operation, to the top administrator in the largest institution or the largest industry.

Yet we still hear people say, even in professional circles, that sanitation is a thing accomplished, that nothing much more needs to be done about it before it is completely under control. This attitude of complacence is a danger signal.

Actually, we should realize that problems of cleanliness and sanitation are never-ending, that the old, well-known problems need constant attention to keep them under control, and that new problems are constantly arising from an ever-changing environment.

What we need today is to be one jump ahead of all potential sources of insanitation and uncleanliness. We need to think of sanitation and cleanliness, not in terms of the measurement and removal of filth, but in terms of the *preplanned prevention* of every possible unclean, unsafe condition in the entire environment!

Patently, this calls for a *whole new type of thinking about sanitation* by those of us responsible for the health and welfare of groups of people, whether these groups be large or small. It calls for an *environmental* approach to health—just as we already have the medical approach, the nursing approach, and the nutritional approach.

At the National Sanitation Foundation, we have just published a five-point statement (in the form of a colorful poster, which is available to anyone interested) representing a synthesis of this new way of thinking about sanitation and cleanliness. We have entitled this statement "An Environmental Approach to Health." The five points it covers are: (a) man's environment, (b) the new philosophy, (c) the challenge, (d) a positive program, and (e) new horizons.

MAN'S ENVIRONMENT

Point 1 in this new program, "Man's Environment," sets forth the following statements:

> Man's physical and mental health is his most precious possession.
>
> Fundamental to health is control of the environment.
>
> First in control of the environment is sanitation.
>
> Traditionally, sanitation has emphasized survival, notably through the control of epidemic disease.
>
> But, today, sanitation is more than a means to survive.
>
> It is a means to thrive.

What we mean here is that sanitary science has played a tremendous role in man's steady march toward health. The control of such diseases as typhoid fever are monuments to the success of our sanitary engineers. The story of the protection of milk, water, and food is a familiar one to dietitians.

Today, however, the American individual—in the family and in the community—expects *more*

[1] Presented before the 37th Annual Meeting of The American Dietetic Association in Philadelphia, on October 28, 1954.

from sanitation than freedom from disease. The public expects not only *safe* food, for example. People are interested in *properly cooked* foods—foods cooked in such a way as to maintain all of their natural nutritional values, foods tastefully and appealingly prepared, foods served in a pleasing manner in a pleasant environment.

That's why we say "Sanitation is more than a means to survive, it is a means to *thrive*!"

But there is one point to remember vividly here, and that is the true meaning of the words "clean" and "sanitary." Something can be sanitary, and yet not necessarily be clean-appearing. Also, something could appear to be clean, and yet not be sanitary at all.

To us in the profession, food and every piece of equipment used at all stages of its preparation and service to the consumer, must be more than "eye-clean." It must be scientifically safe from the public health point of view; it must be sanitary.

THE NEW PHILOSOPHY

Now let me go on to our second statement, "The New Philosophy," which is what the Foundation has for so many years called its "creed":

> Sanitation is a way of life.
> It is the quality of living expressed in the clean home, the clean farm, the clean school, the clean business and industry, the clean neighborhood, the clean community.
> Being a way of life, it must come from within the people.
> It is nourished by knowledge, and grows as an obligation and an ideal in human relations.

The most perfect kitchen in the world—from the viewpoint of layout, location, walls, floor, ceiling, lighting, ventilation, noise control, and the most modern equipment for every operation—does not (by itself) guarantee that the food produced there will be sanitary-safe.

Printing "nine rules of sanitation" and hanging them on the wall will not suffice. Personnel—the human element—is the key to unlocking a steady, uninterrupted flow of safe food from the most modern kitchen.

This is a problem that is still unsolved—how to make your personnel *understand* the need for sanitation, how to make them *want* to practice it. It is, of course, a matter of education, not only in your kitchen, but in the community at large so that your employees come to you with some notion of what sanitation means and (hopefully) with an appreciation of its value to everyone concerned, including themselves.

THE CHALLENGE

The new sanitation philosophy—what people know and believe in—is all-important if we are to meet the challenge of maintaining past gains and overcoming new problems in sanitation as they arise.

> Man's living close to man in an ever-changing environment poses new problems in the maintenance and promotion of health.
> Challenging our ingenuity are
> Modern cities . . .
> Rapid growth of industry . . .
> New products and services . . .
> Modern transportation . . .
> Startling new developments in the sciences.
> Urgently needed today—to safeguard our health tomorrow—is a positive environmental approach to health.

I think this "Challenge" is pretty clear. Sanitation is not a static thing; it changes with man's progress, and on top of yesterday's problems are added new ones.

Take the simple matter of living together. Yesterday, when the campground became contaminated with his own and his animals' waste, the American Indian could pick up his tepee and move to higher ground! He didn't have to fix up his environment—he *changed* it. In certain parts of the world, this is still going on today; we see magazine pictures of "moving-day parties" where a dozen or so natives pick up one thatched hut after another and move a whole village upstream!

In our modern cities, we can't do that. We're stuck and must control the environment. Growing industrial concentration creates new problems of air and river purification; and scientific advances, such as the use of new radioactive and chemical materials, challenge the best of us to protect and improve the common environment.

A POSITIVE PROGRAM

Again, it all comes down to a problem of developing a "positive," constructive program of continuing education that will encourage *people* to want, and to work for superior sanitation.

> A positive, environmental approach to health is
> - Based upon human needs
> - Directed toward human wants
> - Founded upon scientific principles
> - Planned by all groups concerned
> - Operated with human understanding

> Encouraging people to help themselves, it aims at the development of attitudes, understanding, practices and facilities for a clean, sanitary and inspiring environment.

The average American today is using cleanliness and sanitation more and more as part of his daily living habits to secure the things he wants for his family. He appreciates a clean environment. If we can enlist his support, it should not be an impossible job to take a positive approach toward sanitation and cleanliness—to encourage people to help themselves and to have them participate in a community-wide program.

This is a better (if not an easier) way than the old "police method" concerned with finger-pointing and law enforcement and penalties. It avoids talking about rats, filth, and dirt with which people don't care to be associated. It accentuates the *positive* approach of cleanliness for cleanliness' sake—and for the benefits it brings.

NEW HORIZONS

So it seems to me that new outlooks and new opportunities are in sight for the American people for better health and living.

> There are new horizons today for better health through improving our environment.
> The clean man . . .
> in the clean home . . .
> in the clean neighborhood . . .
> promotes not only health, but security, pride and happiness—for himself, his family and the entire community.
> Cleanliness and sanitation of the total environment are measurements of a nation's culture.

What, then, would we "get" out of superior cleanliness and sanitation, if we had all of it that we could possibly desire? If we could visualize a "clean man, in a clean home, in a clean neighborhood," we would see an individual who promotes and radiates health, security, happiness, pride, better understanding, better home relationships, better social relationships—not only for himself, but for the entire neighborhood and community.

Sanitation and cleanliness today are part of the culture of this great nation, and therefore should not be evaluated in terms of a "lid on a garbage can," but in terms of the living habits of people—of their present and future culture.

So much, then, for the Foundation's concept of "An *Environmental* Approach to Health."

THE NATIONAL SANITATION FOUNDATION

The modern health movement demands not only that the latent resources and interest of lay and business as well as professional groups be stimulated, but also that the concern of every individual be welded into a wholeness which will unify the common effort toward better health. Only in this way can each person contribute most effectively and share to the maximum in the undertaking.

It is largely on this basis that the National Sanitation Foundation was incorporated in 1944. In matters of environmental health and sanitation, the Foundation has attempted to provide a common forum through which problems that do exist in this field can be discussed. Therefore, the Foundation many years ago set for itself a seven-point program, to the following ends:

(a) That people in sanitation, both in industry and in the profession, be properly trained, not only originally but continuously.

(b) That a research program be developed to provide these well-trained people with new scientific facts in the field of sanitation.

(c) That an *educational program* be developed to give the entire effort a positive approach and to reach the home and the public.

(d) That interested parties be brought together for open discussion of sanitation problems. (In June, 1948 the first National Sanitation Clinic was held in Ann Arbor. At that time two hundred people from industry met for a full week with another two hundred from official public health agencies to identify and plan an attack on common sanitation problems.)

(e) That a testing laboratory and a "*seal of approval*" program be established, the seals to be offered to the public, industry, and public health people throughout the country as a nationally recognized insignia denoting superior sanitation.

(f) That appropriate publications be produced to promote the entire program.

(g) That textbooks be prepared in the field of environmental health which would emphasize for the first time the new approach to sanitation as a "way of life."

Two of these activities are, I think, of special interest to dietitians at this time; namely, the "food protection program for the nation," which is part of our over-all educational program, and the N.S.F. testing laboratory and seal of approval program.

A FOOD PROTECTION PROGRAM FOR THE NATION

The "food protection program for the nation" is sponsored by the newly organized National Food and Beverage Council, which was established in 1953 under the joint auspices of the National Restaurant Association, the American Hotel Association, the United States Public Health Service, state and local health services, and the National Sanitation Foundation. (The American Dietetic Association is represented on this Council.)

Together, these groups will solicit public understanding and individual sharing in sanitary food practices wherever food and drink are prepared and served—at home, in the school, in the factory or office, at the hotel, restaurant, motel or tavern, at the church and club, or on the picnic grounds.

The National Sanitation Foundation has been invited by the National Food and Beverage Council to act as the coordinating agency to activate the interests of the food and beverage industries and obtain the participation of the public health profession. The planning stage has already brought together, at the Foundation headquarters, leaders in public health and in the food and beverage industries who jointly have suggested recommendations covering: policy, education, ordinance and code, interpretive manual, and research.

As a matter of general *policy*, the Council has declared its objectives to be: (a) the development and promotion of agreed principles for the protection of health, wherever food and beverages are served, publicly or privately; (b) the voluntary coordination of the efforts of industry, official health agencies, and the public in betterment of food and beverage services; (c) improvement of environmental sanitation conditions surrounding such services—in the home, and at public and private food and beverage establishments—throughout the community; and (d) education of the public in the environmental approach to health and "sanitation as a way of life."

The ultimate objective is to encourage people to know the value of and to demand quality food, well prepared, served in a clean and sanitary manner in clean, pleasant surroundings, wherever food and beverages are served.

Education is the thread that binds together the elements of every public health movement. The purpose in this case is to awaken the individual and the entire community to the need of protecting health through the environmental approach. Educational methods involve: (a) the development of coordinated leadership; (b) endorsement and support from food and beverage associations, individual companies, and members of the public (many such endorsements have already been made, including one by the Board of Health of the City of New York); (c) development of educational material and instructional aids to be used at all educational levels; (d) formation of a permanent staff to launch and keep the program going in all its phases; and (e) establishment of pilot programs as demonstrations in representative communities to work out details of activating community-wide educational campaigns, with state and local leadership from health authorities, industry representatives, and from other groups and individual citizens.

Existing *ordinances and codes* governing sanitation requirements in public and private eating establishments should be re-evaluated in the light of present-day conditions and new knowledge. A suggested code should combine the best features of existing regulations and should have the added advantage of being nationally acceptable and uniform for all communities. Such a code should be a joint effort, put together by leading representatives of the food and beverage industries and of public health organizations, both voluntary and official, from federal to local level. The code should be presented to all communities and industry for voluntary and nation-wide adoption.

A *guide* or *manual* is needed to: (a) provide agreed-upon interpretation of sanitation standards; (b) enable both industry and regulatory agencies to have at hand the same set of guiding rules for sanitary operation; (c) offer techniques and methods of conforming to the best sanitary practices; (d) assemble under one cover data relevant to modern food and beverage sanitation; and (e) suggest the responsibilities and opportunities for achieving superior sanitation and protection, of management, health personnel, employees, building designers, equipment manufacturers, and others.

Research should extend into all fields of food preparation and service, in the home and in every place where food is served. Continuing research should be carried on to provide technically correct, up-to-date, practical data to make the proposed program nationally accepted and effective for all. Both fundamental and applied research should be undertaken.

The National Food and Beverage Council's program is significant in three ways:

Politically, it is an example of American free enterprise—of industry and government acting in cooperative concert—voluntarily, effectively, democratically. It is democracy as it should be practiced.

Economically, it is industry working for its own future development through the protection of the market it serves, inside the home and out.

Socially, it is the recognition of an obligation on the part of business and industry and of the public. It is the expression of government's primary interest in helping people to help themselves; it is a positive step toward man's quest to thrive as well as survive.

THE SEAL OF APPROVAL

The second activity of the Foundation that you will be particularly interested in is the Testing Laboratory and its Seal of Approval program. The Testing Laboratory is a separate corporation from that of the Foundation. The Foundation is a nonprofit corporation and is financed by gifts, grants, and bequests. The Testing Laboratory, incorporated in 1952, is a profit-making organization and can charge for services. If the Testing Laboratory makes any profit, it will go to the Foundation, for all the stock of the Testing Laboratory is owned by the Foundation.

In setting up the program of the Testing Laboratory, it was necessary to establish some sort of yardstick, or standards, by which equipment could be measured for sanitary efficiency. Thus, the Foundation has a committee known as the "Joint Committee on Food Equipment Standards," made up of representatives of local, state, and federal official agencies. For each specific problem, industry appoints a Task Committee to work with the Joint Committee.

The purpose of these committees is to explore thoroughly, together, the problems involved in establishing standards for any particular type or piece of food service equipment. For example: in

1948, when the first National Sanitation Clinic was held, discussion was started on standards for soda-fountain equipment. In 1953, five years later, after numerous meetings, the first set of N.S.F. Standards was printed, *Standard No. 1—Soda Fountain & Luncheonette Equipment*. This was the first time in the history of the soda-fountain industry that standards were established on a nationally uniform basis whereby leaders from industry and the public health profession jointly and fully agreed on the contents. They agreed, because they had worked them out themselves!

Since then, the Foundation has published standards on *Food Service Equipment* (Standard No. 2), and on mechanical *Spray-Type Dishwashing Machines* (Standard No. 3). Several other sets of standards are under way, which we hope will be published soon.

As N.S.F. standards are published for various types of equipment, the Testing Laboratory examines and tests equipment in this category to see if it meets the jointly established specifications. If it does, permission is granted for use of the appropriate seal of approval (each seal is numbered—1, 2, 3, and so on—to conform to the number assigned to each set of standards). Periodic re-inspections are made to see that the equipment continues to meet the standards; if not, permission for use of the seal is necessarily withdrawn until it does.

We are very happy to congratulate the manufacturers and builders of food service equipment for their ready willingness to cooperate in this program. Many manufacturers and builders of food service equipment are fulfilling their obligation and meeting the demand of the public for better sanitation. And, they are not only building equipment to meet the specifications of the N.S.F. standards; they are also lending their efforts for further development of the whole idea of better sanitation through assisting the over-all program of the National Sanitation Foundation.

The seal of approval is really a result of nine years of effort put into the program of the N.S.F.—promoting the proper training of people, research, education, "clinics" or meetings, testing laboratory, and now the seal of approval—which helps focus the attention of the public on the need for superior sanitation and the benefits it will bring to all.

Even more than that, it is an example of democracy in action—industry demonstrating, through free-enterprise, leadership in doing something for itself before it comes as a law, rule, or regulation. This approach, it seems to me, is of interest to all people.

While the seal of approval on a piece of equipment denotes that the best sanitation "know-how" has been built into that piece of equipment, by no stretch of the imagination, can it guarantee safe, sanitary food in your kitchen! The attainment of superior sanitation still depends primarily on the *human element*. Understanding of sanitation must be *built into the habits of people*, just as sanitary excellence must be built into machines and equipment.

Our program of testing equipment and the issuance of a seal of approval is a part of the Foundation's over-all program of an "environmental approach to health" which we sincerely hope and believe will be of direct benefit to dietitians in their professional careers.

You are a vital part of this program. We invite your interest, your familiarity with the program, your participation, and your suggestions. We are not a closed corporation. Our goal is the improvement of the quality of American living through a totally new concept of sanitation.

You can help make this goal become a reality.

Long-Term Effect of Ascorbic Acid Supplements

A four-year study of 165 children was conducted in a Canadian residential school to learn the effects of ascorbic acid supplementation for a long period of time on a diet moderately low in ascorbic acid. A total of 89 children remained for the entire four years, 43 serving as control subjects and 46 as experimental subjects. Ages ranged from six to sixteen years. Periodic examinations were made, including blood tests and careful examination of the oral cavities.

Serum ascorbic acid levels of children receiving the ascorbic acid supplements were sufficiently higher than those of the control subjects to make a fairly clear separation of the children into two groups. However, there was no significant difference in the hemoglobin levels of the two groups, nor was there any improvement in oral hygiene and gingivitis rating. Gingivitis developed just as frequently in the supplemented group as in the control group. Thus, these results appear to confirm impressions of other investigators that ascorbic acid plays a minor role in blood formation and in the maintenance of healthy gingival tissues on an average Canadian diet.—*Abstracted from: Ogilvie, G. F., and Pett, L. F.: A long term study on ascorbic acid supplementation. Canad. Services M. J. 10: 191, 1954.*

Cooling Rates and Bacterial Growth in Food Prepared and Stored in Quantity[1]

I. Broth and White Sauce

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COOKED foods held and stored in large quantities usually have slow cooling rates; therefore, organisms causing spoilage of food or food-borne disease are likely to meet favorable conditions for long periods of time. Little research has been done on the effect of holding and refrigerating on bacterial growth in large batches of cooked food. Research in this area should form a basis from which recommendations for safe methods of holding and storing cooked foods can be made. Aside from the aspects of food sanitation, proper methods of caring for perishables also have an important bearing on food cost in institution food service.

Black and Lewis (1) conducted a study to observe the cooling rates of hams, chickens, chicken broth, and custard cooled in several ways. The foods were not inoculated. Cooling time was determined and bacterial counts were made. They found that, in general, internal cooling of the foods was hastened by immediate refrigeration, but that during the first 15 to 20 min. of cooling, the heat loss was essentially the same in or out of the refrigerator. On the whole, the samples, in particular those that were refrigerated, did not support much bacterial growth.

Lewis, Weiser, and Winter (2) inoculated different quantities of chicken salad with *Micrococcus pyogenes var. aureus*. The controls were left uninoculated but were not sterilized. The salads were held for various lengths of time alternately at room temperature and in a refrigerator. The time required for cooling was found to be related to the batch size and the container shape. Salads kept below 50°F. showed practically no increase in bacterial growth, even after 72 hr., but at higher temperatures bacterial growth was rapid. Any change in environment resulted in a "lag" in increase or decrease of bacterial counts. This "lag," according to the authors, must be regarded as a potential danger when large quantities of warm food are refrigerated. It was interesting that in the controls which were not inoculated, the bacterial counts (provided conditions were favorable) were almost as high as in the inoculated samples.

In institutional food service, foods are often held in the kitchen for a considerable time before they are moved to the refrigerator for storage. Unless the food is kept at a temperature above the range at which bacterial growth is possible, this practice may be dangerous.

More information is needed on cooling rates of different-size batches of different foods, and on bacterial growth possible under varying conditions. In institution food service, refrigerator space is often at a premium. When large-quantity food service is set up on a more temporary basis, as, for example, in camps, or when community meals are served, refrigerator space may be extremely limited or even absent. In general, refrigerator temperatures "above 50°F." are considered unsafe and temperatures "below 50°F." are advised. The question remains: under what conditions are temperatures below 50°F. safe or unsafe?

This study was made to determine the cooling rates and bacterial growth in some selected cooked foods under various temperature treatments. The plan was first to study simple foods, such as white sauce and beef broth, and to use *Escherichia coli*

[1] Received for publication August 9, 1954.

[2] Grateful acknowledgment is given to Mary Ann Metaxas and Linda Schaumann Marts, graduate students in the Department of Dairy Industry, for assisting with the study.

as inoculum. Later, more complex food mixtures inoculated with *Micrococcus pyogenes var. aureus* were to be used. The first phase is reported here. Variables studied were: amount of food held and stored, length of holding time at room temperature before refrigerating, refrigerator temperature, and shape of containers used for storing the food. Two temperatures below 50°F. were selected for preliminary study.

Experimental Procedures

PRELIMINARIES

The diurnal and nocturnal temperature fluctuation of a walk-in refrigerator used by the Home Economics Cafeteria kitchen for the storage of cooked foods was studied. From this kitchen three meals are served for six days a week. Approximately 1600 persons are served each day. Many of the left-over foods are precooled before being placed in the refrigerator.

The refrigerator was 7 ft. 9 in. high, 5 ft. 1 in. wide, and 6 ft. 2 in. deep; it was equipped with a fan, a diffusion unit, an air switch thermostatically controlled, and was refrigerated by 16°F. brine. The refrigerator contained six tiers of solid stainless steel shelving.

The minimum box temperature was 39°F. The air temperature inside and outside the cooler was registered by four sets of thermocouples, three inside the box and one outside. Inside the box, the thermocouples were placed as follows: one near the bottom shelf, one near the top shelf, and one in between. They were located approximately 15 to 18 in. away from the food. The temperatures were recorded, electronically, for six working days.

MAIN STUDY

Handling of Food and Equipment Used

Preparation. White sauce was prepared in the Home Economics Cafeteria kitchen. Skim milk reconstituted from nonfat dry milk solids and a roux which consisted of equal amounts of flour and margarine were used. The consistency of the sauces was "standard thin-medium"; 6 oz. flour and 6 oz. fat were used for each gallon of milk. Some variation in consistency was caused by the handling of the sauces during pasteurization and incorporation of the inoculum. The viscosity of the sauces at 80°C. was approximately 2000 centipoises (Brookfield Syncro-Lectric Viscometer, multispeed model LVF, at 30 r.p.m., spindle 4). The *p*H of the batches ranged from 6.45 to 6.60; average *p*H was 6.55. The sauces, while still hot, were taken to a laboratory in the Department of Dairy Industry for further treatment.

The beef broth was prepared from a concentrate[3]. For 1 gal. water, 23 gm. concentrate and 40 gm. gelatin were used. Gelatin was included so that the broth would set to a soft gel on cooling. In general, viscosity at 80°C. was approximately 200 centipoises. The *p*H of the batches ranged from 6.10 to 6.25; average *p*H was 6.2. The broths were prepared in the Laboratory of Bacteriology, Department of Dairy Industry.

Pasteurization and Inoculation. The cooked, hot food was reheated to 160° to 165°F. in a steam-heated water bath, then cooled in a water bath to approximately 115°F. The food was stirred intermittently to improve heat transfer. The bacterial inoculum was suspended in 1 qt. liquid, either pasteurized skim milk for the white sauce or sterile distilled water for the broth. The inoculum was incorporated into the food with a French whip. Thorough distribution of the inoculum was essential, although it was difficult to accomplish with very large batches of white sauce. The inoculated foods were transferred to containers which had been sanitized with 200 parts per million chlorine solution. The containers were covered with heavy aluminum foil.

Types of containers used were: for the 2½-gal. batches, 15-qt. stock-pots 11 in. deep and 10 in. wide; for the 2-gal. batches, 11½-qt. "bootlegs," 8¾ in. deep, 9¼ in. wide at the bottom, and 10½ in. at the top; for the 4-gal. batches, three types of 20-qt. containers, described below; and for the 8-gal. batches, 40-qt. stockpots, 15¼ in. deep and 14 in. wide.

The three types of 20-qt. containers used for the 4-gal. batches were: a tall, narrow stockpot 16 in. deep and 9¾ in. wide; a medium-height stockpot 9⅛ in. deep and 12¾ in. wide; and a shallow rectangular pan, 4½ in. deep, 14 by 16 in. at the bottom, and 14 by 20 in. at the top. These containers will be referred to as "tall," "medium-height," and "shallow." Except for the study on the effect of container, the medium-height stockpot was used for storage of the 4-gal. batches.

Holding at Room Temperature and Refrigeration. Preceding refrigeration, the inoculated food was placed on a wooden cart and held in the laboratory at the Department of Dairy Industry from 0 to 15 hr. as specified. The laboratory temperature varied from 75° to 80°F., thus simulating kitchen temperatures. After the holding period, the containers were placed in the cooler on a wooden cart which stood 3 ft. from the floor. Two brine-cooled, walk-in refrigerators with forced-air fans were used. The temperature of one averaged 42°F., the other 47°F. The refrigerator doors were kept closed throughout the experiment except when samples were removed.

Continuous recording of air and food temperatures during the holding and refrigerating periods was accomplished by the use of a Brown-Honeywell potentiometer equipped for use as a pyrometer. The instrument had facilities for recording the tem-

[3] "Torex," a brown stock substitute; ingredients: water, beef extract, salt, hydrolized plant protein, and starch.

perature at six points once every 2 min. Sterilized, pencil-type copper-constantan thermocouples were inserted into the center of the food mass through small holes in the aluminum foil cap covering the container. In preliminary studies, three thermocouples were used in each container, the first located 1 in. from the surface of the material, another half way down, and a third 1 in. from the bottom. In the main study, the thermocouples were placed in the center of the food mass, since the temperature at this point had been found to be consistently highest. Copper-constantan thermocouples with double-bore insulators were used to record air temperatures in the laboratory and the cooler. The air temperature of the cooler was recorded approximately 2 ft. from the containers.

BACTERIOLOGICAL MATERIALS AND METHODS

The organism used in this study was a strain of *Escherichia coli* isolated from raw milk. This culture was kept on transfer in nutrient broth at 37°C. Stock cultures were kept on nutrient agar and incubated at 10°C.

In preparing inocula, 1 ml. of a two-day culture was diluted by standard methods to 10^{-2} or 10^{-4}, depending on the level of inoculum desired. One to 8 ml. was further diluted with 1 qt. pasteurized skim milk or distilled water before adding to the food.

Samples were removed from the food immediately before and after inoculation and at appropriate intervals for at least 24 hr. Samples were taken in the center of the batch. A 1-ml. sample was transferred by pipette to a tube containing 9 ml. nutrient broth. Tubes of broth were used to make dilutions from 10^{-1} to 10^{-5} which were plated on desoxycholate agar (Difco dehydrated). After incubation at 37°C. for 24 hr., the characteristic red coliform colonies were counted. Few contaminants were encountered. Counts were made with the aid of a Quebec colony counter.

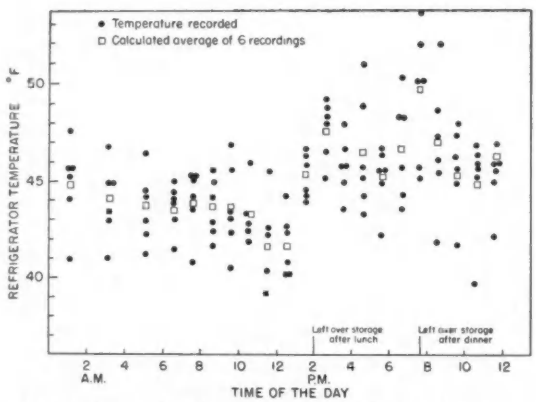

FIG. 1. *Diurnal and nocturnal fluctuation of air temperature in walk-in refrigerator, minimum temperature 39°F. Temperature was recorded continuously for six 24-hr. periods.*

Cooling Rates and Bacterial Counts. The hours required for the temperature of a batch to drop from the temperature at inoculation to 60°F. served as a basis for establishing "total cooling time." The temperature at the time of inoculation was approximately 115°F. Because the temperature conditions during the hours immediately following inoculation may have an important bearing on bacterial growth, the temperature drop during the first 5 and 10 hr. following inoculation was also given in the tables of results.

"Final counts" refer to counts made from samples removed from the batches after an incubation period of approximately 24 hr. In the discussion of final counts, these are divided into groups. Counts below the 10,000-per-milliliter (10^4) level were considered relatively low, those near the 10^6 level and above were regarded as very high.

Although considerable work has been done on the bacteriology of frozen precooked foods, no standards are available at this time regarding permissible bacterial counts for different kinds of cooked foods prepared and stored under conditions of quantity food service.

Results

TEMPERATURE FLUCTUATION IN A REFRIGERATOR

The temperature inside the refrigerator used by the cafeteria varied from 39°F. to 55°F. Two distinct peaks were found, one following the close of the lunch period and the other at the end of the dinner period. The peak following the evening meal was the higher (*Fig.* 1). Evidently, the load of warm food placed in the refrigerator caused the peaks. This was true even though most food was precooled on ice or in cold water before being placed in the cooler. At the close of the evening meal when time is pressing, the precooling was not always carried through as thoroughly as after lunch. Figure 1 also shows that during the night hours when the refrigerator

TABLE 1

Cooling rates and bacterial counts of different-size batches of beef broth inoculated with Escherichia coli. *Refrigerator temperature was 47°F.*

BATCH SIZE	HOLDING TIME AT ROOM TEMPERATURE	TEMPERATURE DROP DURING INITIAL COOLING		TOTAL COOLING TIME TO 60°F.	INOCULUM	LOGARITHM OF FINAL COUNT PER MILLILITER
		5-hr. period	10-hr. period			
gal.	*hr.*	*°F.*	*°F.*	*hr.*	*organisms/ml.*	
2	0	47	57	8.5	13	3.6
2	5	23	49	13.5	13	5.2
4	0	27	45	10	0.9	4.8
4	0	34	49	11	1.8	5.9
4	5	16	45	12.5	1.9	7.0
8	0	19	42	21	5	5.9
8	2.5	13	42	15	1.6	8.2
8	5	14	36	18	<1.0	8.4

was not used, the temperature dropped gradually and, in general, reached a level below 45°F. by 6 A.M. During the day, while food preparation activities went on, the refrigerator temperature did not change much, although temperatures were higher in the afternoon than during the forenoon. Opening and closing of the refrigerator doors had little effect on temperature, raising it only slightly for several minutes. The presence of warm and hot food had a profound effect on refrigerator temperature.

BEEF BROTH

Effect of Batch Size and Holding at Room Temperature

Cooling. Two 2-gal. batches, three 4-gal. batches, and three 8-gal. batches were used. All batches were refrigerated at 47°F. Some were moved to the cooler immediately after inoculation, and some were held for a specified period at room temperature preceding refrigeration. The results are presented in Table 1 and Figure 2. During the 5-hr. period following inoculation, the 2-gal. batches cooled considerably faster than the larger batches, but even the 2-gal. batch, refrigerated immediately, remained in the danger zone for 8½ hr.

Total cooling time to 60°F. increased with the size of the batch and with the length of the holding period preceding refrigeration.

Bacterial Counts. Final plate counts (Table 1, *Fig.* 3) below the 10^4 level were found only in the 2-gal. batch refrigerated immediately following inoculation. In the 4- and 8-gal. batches held at room temperature for a 5-hr. period, and in an 8-gal. batch held for 2½ hr. preceding refrigeration, the final counts were well above 10^6. In all batches except the 2-gal. batch refrigerated immediately, the bacterial growth curve had reached a plateau at the time of the final count.

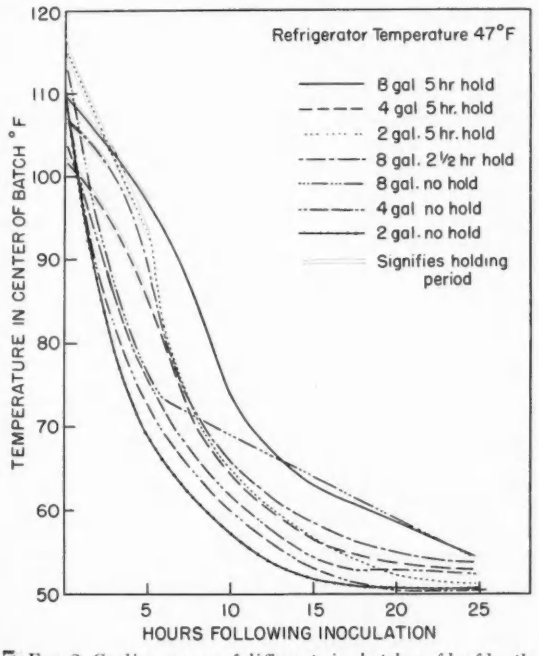

FIG. 2. *Cooling curves of different size batches of beef broth, with and without holding at room temperature. Refrigerator temperature was 47°F. (For bacterial counts, see Figure 3.)*

Effect of Container Shape and Refrigerator Temperature

Container Shape. Three 4-gal. batches were stored. Twenty-quart containers of different shapes were refrigerated at 42°F.

The cooling rates of the three batches were similar. Total cooling time was 7 hr. for the batch stored in the shallow pan against 5½ hr. for the other two batches, but the temperature at inoculation was slightly higher in the batch stored in the shallow pan. Bacterial counts were similar and low, near 10^3.

Under the conditions of this experiment, differences in cooling time were so small that they are probably within the error of the experiment. The low viscosity of the broth and the relatively low refrigerator temperature permitted very rapid cooling. It was, therefore, decided to repeat this experiment using white sauce which is more viscous and to store the batches at a higher refrigerator temperature.

Refrigerator Temperature. The cooling time of the 4-gal. batch refrigerated in a medium-height stockpot at 42°F. may be compared with the cooling time of two 4-gal. batches refrigerated at 47°F. (Table 1). The average cooling time of the batches stored at the higher temperature was approximately twice as long as that for the batch cooled at the lower temperature. Bacterial counts, too, were considerably higher in the batches refrigerated at 47°F. than in the batch cooled at 42°F.

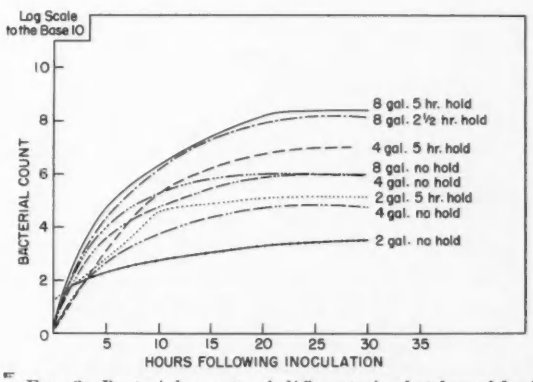

FIG. 3. *Bacterial counts of different size batches of beef broth with and without holding at room temperature. Refrigerator temperature was 47°F. (For cooling curves, see Figure 2.)*

WHITE SAUCE

Effect of Batch Size

Cooling. Batch sizes compared were 2½, 4, and 8 gal. in Study 1, and 2, 4, and 8 gal. in Study 2. In Study 1, the refrigerator temperature was 42°F.; in Study 2, it was 47°F. The results are presented in Table 2 and Figure 4. In general, total rate of initial cooling decreased and total cooling time increased with batch size; the difference was more pronounced at the lower refrigerator temperature (Study 1). This was true even though the food stored at 42°F. had been held at room temperature for 2 hr. before refrigeration. In general, the white sauce cooled more slowly than comparable batches of broth (Table 1, *Fig.* 2). The distortion in the first part of the cooling curve of the 8-gal., 2-hr.-hold batch was probably due to erratic recordings caused by incomplete grounding of the potentiometer at the beginning of the run.

TABLE 2

Cooling rates and bacterial counts of different-size batches of white sauce inoculated with Escherichia coli. *Refrigerator temperatures were: 42°F. in Study 1; 47°F. in Study 2*

BATCH SIZE	HOLDING TIME AT ROOM TEMPERATURE	TEMPERATURE DROP DURING INITIAL COOLING		TOTAL COOLING TIME TO 60°F.	INOCULUM	LOGARITHM OF FINAL COUNT PER MILLILITER
		5-hr. period	10-hr. period			
Study 1—Refrigerator Temperature 42°F.						
gal.	*hr.*	*°F.*	*°F.*	*hr.*	*organisms/ml.*	
2.5	2	37	56	10.5	1.5	4.9
4	2	16	33	14	0.3	6.5
8	2	10	33	19	5	5.4
Study 2—Refrigerator Temperature 47°F.						
2	0	27	39	15	7	5.0
4	0	18	38	20	21	8.5
8	0	19	32	20	unknown	7.9

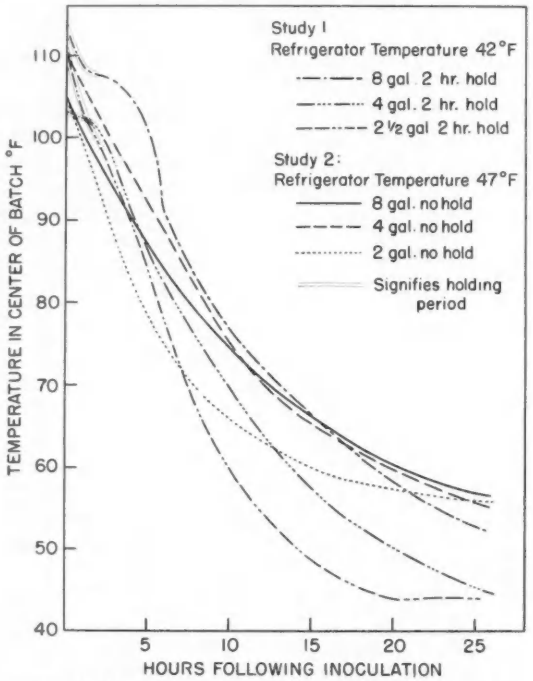

FIG. 4. *Cooling curves of white sauce. Variable: size of batch. In Study 1, refrigerator temperature was 42°F.; in Study 2, it was 47°F. In Study 1, batches were held at room temperature for 2 hr. preceding refrigeration. (For bacterial counts, see Figure 5.)*

Bacterial Counts. Final counts were all above the 10^4 level (Table 2, *Fig.* 5) but the counts were lowest in the 2- and 2½-gal. batches. Counts near 10^8 and above occurred in the 4- and 8-gal. batches refrigerated at 47°F., although they were placed in the cooler immediately following inoculation. In the 4- and 8-gal. batches refrigerated at 42°F., the bacterial growth curve was still on the incline when samples for final counts were removed. In general, bacterial counts increased as cooling rates decreased and total cooling time increased (*Fig.* 4).

The counts found in white sauce were slightly higher than in comparable batches of broth (Table 1, *Fig.* 3).

Effect of Holding at Room Temperature

Cooling. In Study 1, the 2½-gal. batches were held at room temperature for 0, 2, 4, and 6 hr.; the 4-gal. batches were held for 2, 4, and 5 hr. Refrigerator temperature was 42°F. (Table 3, *Fig.* 6). Holding decreased the rates of initial cooling and prolonged total cooling time.

In Study 2, the holding periods for the 2-gal. batches were 0 and 8 hr.; for the 4-gal. batches, 0, 3½, and 5 hr.; and for the 8-gal. batches, 0, 8, and 15 hr. Refrigerator temperature was 47°F. Among the 2-gal. batches, those held for 8-hr. took approximately 5 hr. longer to cool than those refrigerated

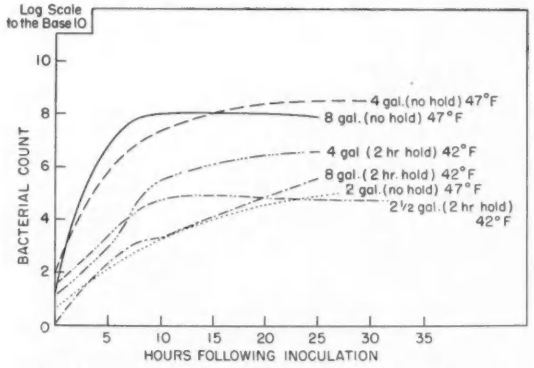
Log Scale to the Base 10
4 gal.(no hold) 47°F
8 gal.(no hold) 47°F
4 gal (2 hr hold) 42°F
8 gal.(2 hr. hold) 42°F
2 gal.(no hold) 47°F
2½ gal.(2 hr hold) 42°F
BACTERIAL COUNT
HOURS FOLLOWING INOCULATION

FIG. 5. *Bacterial counts of white sauce. Variable: size of batch. In Study 1, refrigerator temperature was 42°F.; in Study 2, it was 47°F. In Study 1, the batches were held at room temperature for 2 hr. preceding refrigeration. (For cooling curves, see Figure 4.)*

immediately. The cooling periods of the 4-gal. batches were similar, regardless of holding time. The 8-gal. batches held for 8 and 15 hr. also had similar total cooling times.

Bacterial Counts. In Study 1 (refrigerator temperature of 42°F.), the 2½-gal. batches refrigerated immediately had bacterial counts near the 10^4 level (*Fig.* 7). The counts of the 2½-gal. batches held for 2, 4, and 6 hr. at room temperature prior to refrigeration varied markedly, but all were above the 10^4 level. In the 4-gal. batches, the counts were near or above 10^6.

In Study 2 (refrigerator temperature of 47°F.), bacterial counts were above 10^4 in all batches. Highest counts were found in the 8-gal. batch and in a 4-gal. batch held at room temperature for 5 hr. before refrigeration.

Effect of Refrigerator Temperature

Cooling. The data on batches that were comparable or nearly comparable are presented in Table 4. In general, total cooling time to 60° F. increased when the refrigerator temperature was increased from 42°F. to 47°F.; the effect was most pronounced in the small batches refrigerated immediately following inoculation. In the larger batches, the effect of refrigerator temperature was negligible. In the larger batches held at room temperature before refrigeration, the effect of holding may have masked the effect of the low refrigerator temperature.

Bacterial Counts. In the 2-gal. batches, counts were considerably lower in the sauce when refrigerated at 42°F; they were below the 10^4 level. The 8-gal. batch refrigerated at 42°F. also had lower counts than the 8-gal. batch refrigerated at 47°F., although the latter was placed in the refrigerator at once. Attention is called to Figure 5 where bacterial counts of different-size batches refrigerated at two temperatures are presented: a 4-gal. batch refrigerated immediately at 47°F. had considerably higher bacterial counts than a comparable batch refrigerated after a 2-hr. holding period at 42°F. Evidently, the holding period was sufficiently short for the lower refrigerator temperature to have an effect.

TABLE 3

Cooling rates and bacterial counts of white sauce batches inoculated with Escherichia coli. *Length of holding period at room temperature preceding refrigeration varied. Refrigerator temperatures were: 42°F. in Study 1; 47°F. in Study 2*

BATCH SIZE	HOLDING TIME AT ROOM TEMPERATURE	TEMPERATURE DROP DURING INITIAL COOLING		TOTAL COOLING TIME TO 60°F.	INOCULUM	LOGARITHM OF FINAL COUNT PER MILLILITER
		5-hr. period	10-hr. period			
Study 1—Refrigerator Temperature 42°F.						
gal.	*hr.*	*°F.*	*°F.*	*hr.*	*organisms/ml.*	
2.5	0	50	68	7	0	—
2.5	0	34	50	11	5.4	4.2
2.5	0	41	57	9	201	3.2
2.5*	2	37	56	10.5	1.5	4.9
2.5	4	27	51	10	15	4.8
2.5	6	8	47	14	17	5.9
4	2	16	33	14	0.3	6.5
4	4	14	34	14.5	0.3	5.7
4	5	6	28	14.5	unknown	7.1
4	5	5	28	14.5	7	7.3
Study 2—Refrigerator Temperature 47°F.						
2	0	27	39	15	7	5.0
2	0	20	46	17.5	—	—
2	8	9	24	22	7.1	6.6
2	8	10	25	20	—	—
4	0	16	36	15	21	6.2
4	0	15	34	13	13	6.4
4	3.5	10	26	19	7	5.1
4	5	20	38	17.5	34	8.1
8	0	19	32	20	unknown	7.9
8	8	13	7	36	54×10^2	8.0
8	15	9	18	35	46×10^3	8.1

* Used in Table 2.

Effect of Container Shape

Twelve 4-gal. batches were used. The holding periods preceding refrigeration were 0, 5, 10, and 15 hr. Refrigerator temperature was 47°F. In Studies

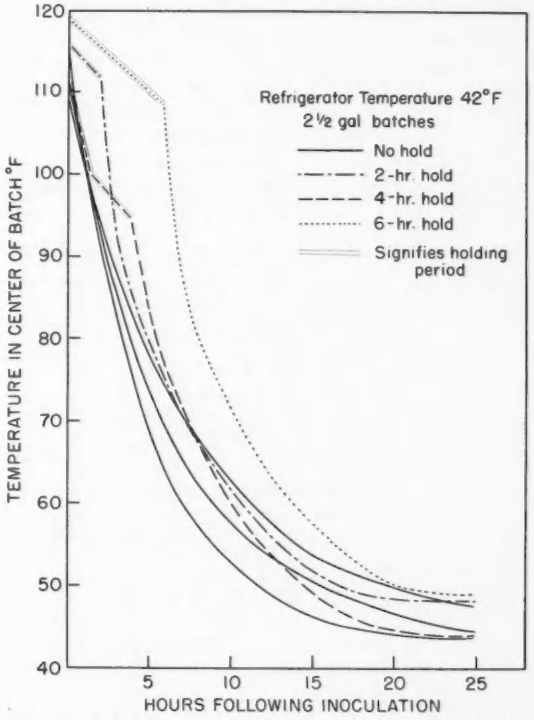

FIG. 6. *Cooling curves of white sauce. Variable: length of holding period preceding refrigeration. Refrigerator temperature was 42°F. (For bacterial counts, see Figure 7.)*

TABLE 4

Cooling rates and bacterial counts of white sauce batches inoculated with Escherichia coli *and refrigerated at 42°F. and 47°F*

BATCH SIZE	REFRIGERATOR TEMPERATURE	HOLDING TIME AT ROOM TEMPERATURE	TEMPERATURE DROP DURING INITIAL COOLING		TOTAL COOLING TIME TO 60°F.	INOCULUM	LOGARITHM OF FINAL COUNT PER MILLILITER
			5-hour period	10-hr. period			
gal.	*°F.*	*hr.*	*°F.*	*°F.*	*hr.*	*organisms/ml.*	
2	42	0	29	46	9.5	1.7	3.9
2*	47	0	27	39	15	7	5.0
4	42	5	16	28	14.5	unknown	7.1
4†	47	5	20	38	17.5	45	8.1
4	42	4	14	34	14.5	0.3	5.7
4	47	4	10	26	19	7	5.1
8*	42	2	10	33	19	5	5.4
8*	47	0	19	32	20	unknown	7.9

* Used in Table 2.
† Used in Table 3.

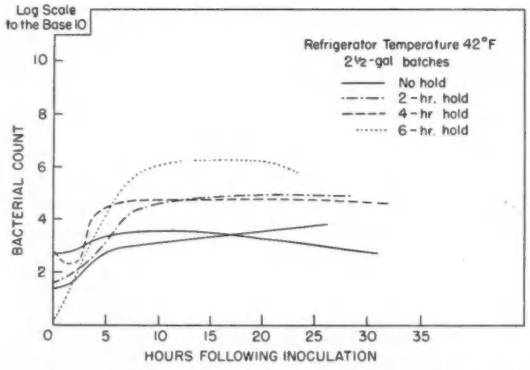

FIG. 7. *Bacterial counts of white sauce. Variable: length of holding period preceding refrigeration. Refrigerator temperature was 42°F. (For cooling curves, see Figure 6.)*

2, 3, and 4, the inoculum was mixed into 8 gal. of sauce and the mixture held at room temperature for a specified length of time. The batch was then split into two 4-gal. portions and transferred to two 20-qt. containers of different shape. The results are presented in Table 5.

Cooling. Of the batches refrigerated immediately after inoculation (Study 1) and of the batches held for a 5-hr. period preceding refrigeration (Study 2), those stored in the shallow pans cooled considerably faster than those stored in the stockpots. Cooling time was similar in the medium-height and tall stockpots (Studies 2, 3, and 4).

Bacterial Counts. Of the batches refrigerated immediately (Study 1), final counts were somewhat higher in the batches stored in the medium-height stockpot than in the other two containers. Faster cooling may explain the lower counts in the batch stored in the flat pan. Final counts were below 10^4 in the shallow pan and the tall stockpot. In the batches held at room temperature preceding refrigeration, bacterial counts were similar, regardless of the shape of containers. The counts were above the 10^4 level.

Discussion

The study on the temperature fluctuation in a walk-in refrigerator showed that the temperature fluctuated considerably in spite of the forced air fan. Definite peaks in temperature occurred after the close of the noon and night meals, but not after breakfast. The average refrigerator temperature decreased during the morning hours even though the refrigerator door was opened rather frequently. This points toward the great effect of warm food on refrigerator temperature. It is to be expected that, in a refrigerator not equipped with a forced-air fan, temperature increases caused by placing warm food in the refrigerator may be even higher. The implications are that, as a basis for efficient control of a refrigerator, frequent checking of the temperature at different times of the day, especially after warm food has been placed in the cooler, is necessary. Neglect of frequent checks may lead to false security.

In the present study, the food placed in the refrigerator was warm, not hot. Even the food "refrigerated immediately" was at approximately 115°F., a temperature favorable to bacterial growth.

The refrigerator temperatures chosen were below 50°F.; one was 47°F., and the other 42°F. The results indicate that at 47°F., the food cooled very slowly and temperature conditions favorable for bacterial growth prevailed for a long time. At 47°F., white sauce stored in batches as small as 2-gal. allowed profuse growth of the inoculum. The question of what would happen if batches smaller than 2-gal. were used for storage was not investigated; it seemed unrealistic to assume that, in most situations when food is prepared and served in quantity, sufficient shelf space is available for the practice of storing

TABLE 5

Cooling rates and bacterial counts of 4-gal. batches of white sauce inoculated with Escherichia coli *and refrigerated at 47°F. in containers of same volume but different shape*

SHAPE OF CONTAINER	TEMPERATURE DROP DURING INITIAL COOLING		TOTAL COOLING TIME TO 60°F.	INOCULUM	LOGARITHM OF FINAL COUNT PER MILLILITER
	5-hr. period	10-hr. period			
Study 1—Immediate Refrigeration					
	°F.	°F.	hr.	organisms/ml.	
Shallow*	47	62	11.5	—	—
Tall*	19	42	>24	—	—
Shallow	36	50	10.5	270	2.5
Tall	14	31	20	270	3.2
Medium-height*	15	34	20	120	5.4
Study 2—5-Hr. Holding Time Preceding Refrigeration					
Tall	6	19	>24	0.9	6.2
Medium-height	7	26	24	0.9	6.5
Shallow	10	49	14.5	320	7.5
Medium-height	10	37	28	320	8.2
Study 3—10-Hr. Holding Time Preceding Refrigeration					
Tall	5	10	22.5	150×10^3	8.3
Medium-height	5	10	21.5	150×10^3	8.5
Study 4—15-Hr. Holding Time Preceding Refrigeration					
Tall	17	30	>24	140×10^3	7.0
Medium-height	15	30	>24	140×10^3	7.6

* For description and measurement see "Experimental Procedures."

food in very small batches. Shelf space is at a premium in many refrigerators.

A temperature of 42°F. also supported bacterial growth in all batches studied, but here the bacterial multiplication was much less. Batch size and length of time the food was held at room temperature preceding refrigeration had pronounced effects. Relatively low bacterial counts were found in 2- and 2½-gal. batches of white sauce refrigerated immediately following inoculation. Although low counts were found in some of the 4-gal. batches of broth, the results are not applicable to all types of broth. For example, broths with greater jelling power than those used in this study may be expected to cool more slowly; to provide favorable temperature conditions for bacterial growth for a longer period of time; and therefore, to be potentially dangerous. Also, white sauces thicker than those used in this study can be expected to have longer cooling times than those reported here.

The practice of holding cooked food at lukewarm temperatures may be looked upon as dangerous. This study showed that immediate refrigeration following inoculation resulted in fastest cooling rates and lowest bacterial counts. The effect of holding was twofold: during the holding period, the bacteria were given a chance to pass through the lag period quickly and the process of multiplication was, in general, under way when the food was refrigerated; in addition, total cooling time was prolonged by holding, and temperature conditions favorable to bacterial growth prevailed longer.

The results of the experiments on the effect of container shape are somewhat difficult to evaluate. In the broth, there was little difference in the cooling rates and bacterial counts among the batches stored in the different containers. In the white sauce, batches stored in shallow pans cooled fastest; bacterial counts were somewhat lower in the shallow pan and in the tall stockpot than in the medium-height stockpot. The shallow pans were difficult to handle when they contained liquid food material, and they consumed much shelf space. The tall stockpots were easy to handle and required less shelf space than the medium-height containers, Although under the conditions of this study bacterial counts were lower in the shallow and the tall containers, more work is necessary before definite conclusions can be drawn and recommendations made.

In the present study, final counts were relatively low, below the 10^4 level, in batches that cooled at approximately 40°F. or more, during the first 5 hr. following inoculation. For greatest safety, warm food when stored should pass through the temperature range favorable for bacterial growth (115°F. to 60°F.) quickly. Jensen (3) gives a margin of safety and suggests that the range should be widened to include temperatures from 120°F. to 50°F. and that the food should pass through this range within 4 hr. None of the batches in the present study fulfilled this requirement, and it may well be expected that foods more viscous than broth or white sauce cool even more slowly. To effect faster rates of cooling than achieved in this study, the size of batch could be decreased to below 2 gal. or the refrigerator temperature decreased to below 42°F. To reduce batch size below the 2-gal. quantity seems rather impractical for conditions of quantity food service. Wherever and whenever shelf space becomes scarce, the maintenance of temperatures lower than 42°F. is suggested as a safeguard against slow cooling, one of the important factors in bacterial development.

Summary and Recommendations

In a preliminary study, the diurnal and nocturnal temperature fluctuation of a walk-in refrigerator equipped with a forced-air fan was determined. It was found that temperature fluctuations were very great.

The main study was concerned with the effect of various temperature treatments on the cooling rates and the bacterial counts of beef broth and white sauce. The foods were inoculated with *Escherichia coli*. Batch size was varied from 2 to 8 gal. Treatment after inoculation was varied as follows: some

batches were refrigerated immediately, others were held for varying lengths of time at room temperature before they were placed in a refrigerator. Two refrigerator temperatures, 42°F. and 47°F., were used; temperature fluctuation was very small.

It was found that the more viscous foods cooled more slowly, remaining for longer periods at temperatures favorable to bacterial growth. Length of cooling time increased with the size of batch and the time the food was held at room temperature before it was refrigerated. A 42°F. refrigerator gave much faster cooling rates than a 47°F. cooler. At 47°F., cooling time of the 4- and 8-gal. batches was dangerously long.

On the basis of these results, it does not seem advisable to store foods in batches larger than 2½ gal. Holding warm food at room temperature favored bacterial growth; therefore, warm foods should not stand at kitchen temperature. Refrigerator temperatures of 42°F. or lower are suggested.

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BIOGRAPHICAL NOTES ON THE HISTORY OF NUTRITION

Jean Baptiste Boussingault—February 2, 1802–May 11, 1887

Boussingault—French chemist, physicist, and mining engineer—is credited with being the first to take chemistry to the field and stable. He introduced the method by which agricultural science was to be developed and which became one of the bases of the modern science of nutrition. The first recorded nitrogen balance studies on animals were made by Boussingault. This, together with his work on food rations and on the influence of various chemical agents on the growth of plants, made him famous.

Jean Baptiste Joseph Dieudonne Boussingault was born in Paris, February 2, 1802. He was educated in science at the School of Mines at St. Etiènne, and at the age of twenty was appointed a professor at the mining school in Bogota, Colombia. Later he engaged in mining work and traveled extensively in other parts of South America, where he observed the occurrence of goiter in some communities. Analysis showed that the iodine content of salt differed between goiterous and non-goiterous regions, and in 1833, Boussingault recommended the use of "iodized" salt.

He returned to France with a reputation for scientific investigation and was for a short time Professor of Chemistry at the University of Lyons. He then became Professor of Agriculture (1839) at the School of Arts and Trades in Paris, where he remained till his death in 1887. In 1839 he published the results of his nitrogen balance studies on a lactating cow and on a horse. Food, urine, and feces were analyzed, as was the milk of the cow. The analytical methods of that time for nitrogen—those of Dumas—presented many difficulties when applied to food and excretory products. Boussingault was able to show that animals do not fix atmospheric nitrogen as plants do, and that nitrogen-containing foods are essential in the diet of animals.

Boussingault at first thought that all the fat of an animal's body was obtained from fat in the food, but later (1845) in experiments with eleven geese—five serving as controls and six being fattened for thirty-one days—he showed that the fat was formed within the body from carbohydrate. Similar results were obtained with ducks.

Soon after his return from South America, his wife's estate at Bechelbronn became the experimental farm where much of his work on animal feeding, crops, and the effect of fertilizers was carried on. There, his laboratory became what may be called the first agricultural experiment station.

Boussingault published many papers and books. *Rural Economy* (1844) was translated into English. Later it was revised and enlarged with the addition of years of research and published (1860–74) as seven volumes, *Agronomie, Chimie Agricole et Physiologie.*

Boussingault was a most careful investigator, of slow deliberation and painstaking care, with vision to see how to solve problems. His method is illustrated by his statement, "One must know how to criticize himself; it is not till after he has exhausted all objections that he can estimate the value of them, and come to a conclusion." A frequently-published portrait shows him looking like a prosperous and intelligent country gentleman. He received many honors in his own country and the Copley Medal the Royal Society of London.

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Dietary Control of the Post-Gastrectomy "Dumping Syndrome"[1]

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FOLLOWING gastric resection, approximately 11 per cent (reported in different series of patients as 3 to 30 per cent [1–7]) of patients experience distress after eating. In some patients, the symptoms occur during or soon after eating; in others, an hour or two after eating. The early discomfort is more common than the later, but both may occur in the same patient. The actual incidence of the post-prandial discomfort is difficult to ascertain. In some patients, the symptoms are so mild that their presence must be elicited by specific questioning. Disabling symptoms are found in about 2.2 per cent of patients (ranging from 0.7 to 3.2 per cent [1–7]). It is generally agreed that this complication is much less frequent after gastroenterostomy, and presumably is related to the resection itself. Since the type of reconstitution of the gastroenteric continuity seems to be unrelated to the frequency of the syndrome's occurrence (8–10), the direct relationship appears to be closely associated with the segment of stomach removed. This contention is borne out by studies on the physiology of gastric evacuation (11). It has been conclusively demonstrated that when the pyloric antrum and proximal duodenum are removed, delay in gastric emptying by the presence of fat is no longer observed. This is not true when a simple gastroenterostomy is done.

Equally as important clinically is the failure of partially gastrectomized patients to gain weight. Such a nutritional problem is met in a significant number of patients. Some patients who have difficulty in maintaining their weight suffer from complications, such as the "dumping syndrome" or recurrence, but many are able to work and essentially are asymptomatic aside from the inability to gain weight. Following gastric resection, 40 to 50 per cent of patients are unable to maintain their average preoperative weight (4–7, 12, 13). Most of these are actually below their optimal weight.

This report is concerned with the ease with which both the "dumping syndrome" and the "suboptimal weight" complex can be managed by proper supervision of total caloric intake and the source of these calories from protein, carbohydrate, and fat. A tremendous step forward in understanding the nature of the severe symptomatic complex has been made (14). The oral administration of hypertonic glucose, saline, or protein hydrolysates to gastrectomized patients produces an immediate increase in jejunal motility as seen fluoroscopically or as measured with intraluminal balloons. Within 10 min. after administration of such materials, a progressive decrease in plasma volume and hemoconcentration occurs which lasts about 20 to 30 min.; this is followed by an increase in plasma volume and hemodilution which reaches a maximum in 70 to 80 min. The clinical symptomatology of the "dumping syndrome" is produced simultaneously in most cases.

CAUSE OF NUTRITIONAL DEFICITS

Since this clinical syndrome can be reproduced readily in the symptomatic patients by the usual diet, it seems reasonable to postulate that the ordinary diet provides a mixture of food with readily hydrolyzable components which, on digestive hydrolysis, produce a hyperosmolar mixture in the proximal small bowel. This is readily accomplished because, as noted above, the restraint to rapid gastric evacuation is missing. The hyperosmolar mixture rapidly is rendered isotonic by the withdrawal of water from the circulating blood, producing an acute reduction in effective circulating blood volume and the concomitant symptoms of a vasomotor, shock-like complex (tachycardia, palpitation, perspiration, dizziness, and nausea). A prominent, but not often discussed symptom of this clinical entity is the diarrhea which frequently follows food ingestion. The sudden distention of the small bowel stimulates a peristaltic rush which is mediated through the vagi and local intramural reflexes, explaining why atropine has been suggested to control the symp-

[1] Presented at the 37th Annual Meeting of The American Dietetic Association in Philadelphia, on October 28, 1954.

toms (15). The increased rate of transit may well aid in an explanation for the recorded fecal losses of nitrogen and fat in these patients (16–18).

In some patients, the symptoms are so mild that their presence must be learned by specific questioning (2) and if the definite symptomatology recognizable as the "dumping syndrome" was not forthcoming, the patient would have been classified in the group represented by those who fail to gain weight and who are basically asymptomatic. In other words, the patient who fails to regain to his pre-operative weight or to maintain a satisfactory body weight level postoperatively is probably unconsciously restricting his caloric intake because of a presumably unrecognized discomfort due to eating. In summary, nutritional deficits following gastric resection arise from the same etiologic mechanisms but may range from severe symptomatology to an asymptomatic failure to gain weight.

CORRECTING NUTRITIONAL DEFICITS

The clinical material presented in this study is composed of seven cases, all male, suffering from varying degrees of the "postgastrectomy nutritional deficit syndrome." One patient on whom data are presented in considerable detail was the most symptomatic of the group, and his weight curve in Figure 1 shows the greatest degree of malnutrition. Also in Figure 1, the patient showing a small weight loss after operation and still under observation was very symptomatic. The next two patients with increasing weight losses were completely asymptomatic except for inability to gain weight; nevertheless, they volunteered the information during hospitalization that the therapeutic diet was accepted with greater enjoyment and ease than *ad libitum* selection of foods, even though the corrective diet contained about twice the previous caloric intake and a large amount of fat.

It is evident from Figure 1 that hospitalization is mandatory for the correction of the nutritional deficit. This became evident from observing patients who were advised concerning the dietetic program on an ambulatory basis and failed to respond; when hospitalization was instituted, prompt improvement ensued. A simple explanation for this readily became apparent. The physician and dietitian caring for such a patient soon realize that the subdivisions of the diet into meals must be shifted to meet the idiosyncrasies of the patient and the refeeding period for recovery from malnutrition is really the critical period for such patients. During hospitalization, a diet suitable to each patient can be developed within the general framework of the therapeutic requirements. The patient will learn *his* diet, and such a diet will become part of his pattern of living after discharge. The improvement is continued after departure from the hospital (*Fig.* 1).

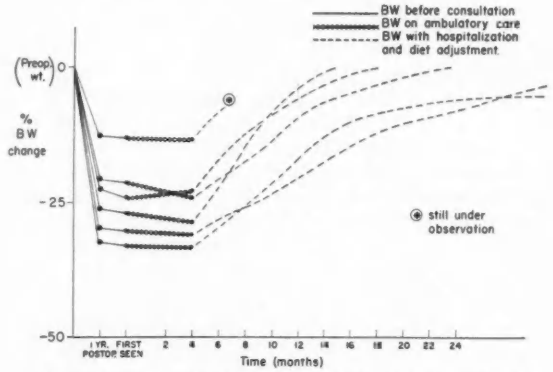

FIG. 1. *Weight curves for the six patients reported in this study. Note that the different types of weight lines indicate different periods in each patient's management.*

DETAILED CASE STUDY

During this part of the discussion, constant reference should be made to Table 1. Observed rates of body weight change in grams were made by weighing the patient under basal conditions on a balance sensitive to 5 gm.; calculated weight changes were made from caloric and metabolic balance data.

Calculated basal caloric expenditures were determined from a nomogram with a correction made for age and based on the original Benedict formula for surface area (19, 20). Observed basal calories were determined by the use of a Krogh spirometer. Calculated daily energy expenditure was obtained by multiplying the daily basal calories by a factor of 2 (21). The probable daily energy expenditure was similarly obtained by multiplying by 2 the measured basal calories for 24 hr. Caloric values for foods were those customarily accepted as 4 per gram for protein and carbohydrate and 9 for fat. Urinary and fecal nitrogen was calculated as representing 26.51 calories per gram (21). Since no carbohydrate was lost in the urine or stool, 30 gm. body weight (22, 23) lost or gained was interpreted from 1 gm. nitrogen negative or positive balance. Calories in the caloric balance not accounted for by nitrogen balance were assumed to have originated from the metabolism of either endogenous or exogenous fat. The patient was homeothermic throughout the study.

The patient's best weight was at age of forty-three (Table 1), ten years before the onset of uncontrollable pain from peptic ulcer; at that time he weighed 77 kg. with a surface area of 1.95 sq. m. and had a basal energy expenditure of 1778 calories per day. With a doubled expenditure due to activity, it is estimated that his daily caloric production amounted to 3556. He is assumed to have been in caloric and nitrogen balance since he was neither gaining nor losing weight. When he developed intractable ulcer symptoms at fifty-three years of age, he had lost no weight although his basal calories amounted to 1717 per day with a probable total daily energy expendi-

ture of 3435 calories. Ten days after a high subtotal Hofmeister-Billroth II gastric resection plus selective vagotomy, he displayed the usual metabolic response to trauma with a weight loss to 75.25 kg. and a total daily energy expenditure of 3400 calories. At this time, findings characteristic of the "dumping syndrome" were present. A prominent feature of his symptomatology was a diarrhea of six to eight large bulky stools per day.

Two months later, his weight had decreased to 61.0 kg. (from a pre-operative weight of 77.0 kg.), a loss of 16 kg. He was hospitalized and carefully followed on a metabolic balance program, with a diet containing 2190 calories, 80 gm. protein, 175 gm. carbohydrate, and 130 gm. fat. He was able to consume only an average of 1670 calories. This program was followed for thirty days and the values given in Table 1 are daily averages for the entire period. During this Observation Period 1, with a surface area now only 1.76 sq.m., he had a calculated energy

TABLE 1

Data on weight change and caloric utilization of Patient J. B. (height—5 ft. 10. in.; occupation—financial consultant)

DATE OF OBSERVATION	BODY WEIGHT	RATE OF CHANGE IN BODY WEIGHT ($\frac{observed}{calculated}$)	SURFACE AREA	BASAL CALORIES ($\frac{observed}{calculated}$)	CALORIC EXPENDITURE ($\frac{probable}{calculated}$)	CALORIC CONSUMPTION RATIOS ($\frac{offered}{consumed}$)				CALORIC LOSS				CALORIES UTILIZED	CALORIC BALANCE	NITROGEN BALANCE
						Total	Protein	Carbohydrate	Fat	Total	Urinary nitrogen	Fecal nitrogen	Fecal fat			
	kg.	*gm./day*	*sq. m.*													*gm.*
10 years pre-operative—age, 43	77*		1.95	?/1778	?/3556											
Immediately pre-operative—age, 53	77		1.95	?/1717	?/3435											
10 days postoperative	75.25		1.93	?/1700	?/3400											
Observation Period 1—30 days; 2 months post-operative	61.0	−285/−329	1.76	1647/1550	3294/3100	2190/1670	320/260	700/600	1170/810	458	291	95	72	1212	−2082	−3.6
Postoperative																
4 months	54.9	−101	1.68													
6 months	41.8	−52	1.64													
8 months	49.8	−33	1.62													
10 months	48.8	−18	1.60													
12 months (age, 54)	48.2	−9	1.59													
14 months	47.9	−6	1.59													
16 months	47.7	−3	1.59													
18 months	47.5	−2	1.59													
20 months	47.3	−2	1.59													
22 months	47.3	−1	1.59													
24 months (age, 55)	47.2	−1	1.59													
26 months	47.1	−1	1.59													
28 months	46.9		1.59													
Observation Period 2—30 days; 2½ years postoperative; age, 55	46.9	−1/−38	1.56	759†/1355	1517/2710	2190/1566	320/252	700/585	1170/729	386	167	111	108	1180	−337	0
Observation Period 3—15 days	46.9	12/270	1.56	759†/1355	1517/2710	1950/1950	400/400	200/200	1350/1350	252	132	53	67	1698	181	9
Observation Period 4—15 days	47	197/210	1.56	964/1355	1928/2710	3160/3100	600/600	400/340	2160/2160	276	132	53	81	2824	896	7
Following Observation Period 4																
2 months	57															
4 months (age, 56)	65															
6 months	66															
8 months	68															
12 months	70															

* Best weight.

† 44 per cent.

expenditure of 3100 calories per day and a probable expenditure of 3294 per day, leaving a negative caloric balance of 2082 calories per day. With the co-existent diarrhea which resulted in a fecal loss of 95 calories from protein and 72 from fat, totalling 458 calories, and a urinary nitrogen loss equivalent to 291 calories, he was only 3.6 gm. in negative nitrogen balance. The principal metabolic deficit was inadequate intake. From the data in the table, it was calculated that his weight loss would be 329 gm. a day; it was actually 285 grams.

Table 1 demonstrates both the progressive weight loss following the first period of observation and the rapidly diminishing *rate* of body weight loss.

Two and one-half years after operation, the patient again was admitted for observation (Period 2). At this time his body weight was 46.9 kg., and surface area was 1.56 sq. m. His calculated basal and probable caloric expenditure rates were 1355 per day and 2710 per day, respectively. The observed basal rate, however, was only 759 calories per day, a decrease of 44 per cent below normal (24), not an unusual observation in prolonged starvation. Consistent with other observations (4), this patient was now in nitrogen balance, though on essentially the same caloric and food-type intake as during the first observation period. The negative caloric balance had been reduced from 2082 to 337 calories per day by physiologic adaptation to starvation. Fecal loss of calories was even greater than before, since the patient's diarrhea was, if anything, more severe. From metabolic and caloric balances, it was calculated that he would lose about 38 gm. a day in body weight, whereas he actually lost only 1 gm.

The third period of observation was composed of a fifteen-day interval immediately following the above. During this time, the patient was changed to a diet of lower total caloric intake (1950 instead of 2190), composed of 100 gm. protein, 50 gm. carbohydrate, and 50 gm. fat. No fluids were allowed with meals. With minor dietary adjustments rapidly made between patient, physician, and dietitian, the patient soon showed an average daily positive nitrogen balance of 9 gm. and a positive caloric balance of 181 calories per day. These beneficial responses were noted, even though the new diet contained fewer calories; the patient nevertheless consumed all that was offered in contrast with the previous diet. It is most significant that after three days on the new diet, all signs and symptoms of the "dumping syndrome" were absent and the diarrhea had completely disappeared. The calculated weight gain for this period was 270 gm. per day, but the patient actually gained only 12 gm. daily.

The fourth period of observation—again fifteen days—followed immediately. It was designed to provide a caloric intake of about one and one-half times the probable calories expended. At this time the patient weighed 47 kg. with a surface area of 1.56 sq. m. The measured basal calories were 964, improved from the previous period but still below the calculated 1355 per day. The probable daily energy expenditure was 1926 calories (cf., calculated 2710). His diet provided 3160 calories, 150 gm. protein, 80 gm. carbohydrate, and 240 gm. fat. The daily average consumption was 3100 calories with a positive caloric balance of 896 and a positive nitrogen balance of 7 gm. The calories lost on this regimen were not greatly different from those of the previous period—except for an increase in fecal fat, which was not above the percentage limits of normal. The patient remained completely asymptomatic throughout this period and to this date on ambulatory treatment.

During Observation Period 4, metabolic and caloric data predicted a weight gain of 210 gm. per day; the patient showed a daily 197-gm. increase.

Follow-up data in Table 1 show that he continued to gain weight on this program but at levels of decreasing increments. The reason for this is that as weight is added, the surface area increases and geometric increases must be made in caloric excesses to

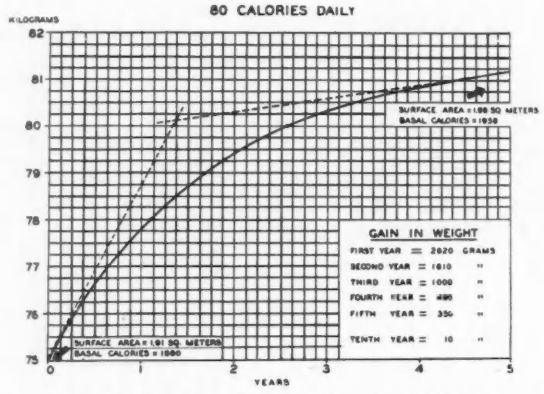

FIG. 2. *Diminishing gain in weight with an initial excess of 80 calories daily.* (*Reprinted with permission from* Some Fundamental Principles of Metabolism [*21*])

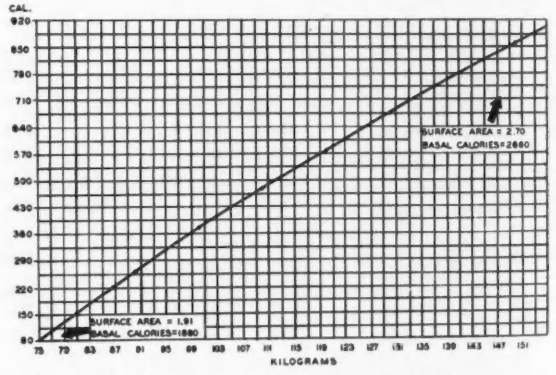

FIG. 3. *Increasing caloric requirment to maintain an excess of 80 calories daily.* (*Reprinted with permission from* Some Fundamental Principles of Metabolism [*21*])

maintain a constant rate of gain (*Fig.* 2 and 3), and this patient has been continued on 3600 to 4000 calories per day.

The other six patients were managed on the same dietary regimen with complete subsidence of symptoms and restoration to or towards pre-operative weight levels (*Fig.* 1). Two of the seven patients who had displayed both the early ("dumping") and the late ("hypoglycemic" [15]) symptoms were equally well controlled. The high-protein and low-carbohydrate content of the diet appears to be as adequate in the control of this induced hypoglycemia as it is in the management of functional hyperinsulinism (25).

SUMMARY

With the evidence that after a gastrectomy the inhibitory effect of a high-fat diet on gastric evacuation is lost, it becomes apparent that a disadvantage from the operation can be turned to the patient's advantage. The satiety value of a high level of fat in the diet (gastric filling) is to a large part lost and such a diet easily can be fed to a patient. To prevent the rapid development of a hyperosmolar solution in the proximal jejunum, a diet of high-fat, high-protein content (slowly hydrolyzed) should be fed to the maximum exclusion of carbohydrate (easily hydrolyzed). A satisfactory diet is one with the caloric ratios from carbohydrate, protein, and fat respectively 1:1.5:5.

With the recognition of the high incidence of nutritional problems after gastrectomy, the dietary advice given such a patient when discharged from the hospital after operation probably should be of this type as a reasonable preventive measure.

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Eskimos make ice cream from cloudberries, seal oil, and caribou tallow beaten to the consistency of whipped cream, according to Dr. A. E. Porsild, author of *Edible Plants of the Arctic.*

Metabolic Studies with Pre-Adolescent Girls

II. Energy Absorption[1]

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IN PART I of this series of papers on metabolic studies with pre-adolescent girls, the experimental design was discussed in detail and carotene utilization data were presented (1). The present report deals with the energy absorption of the six girls. Nitrogen and calcium balances will be discussed in Parts III and IV, respectively, of this series.

Within recent years there has been a revival of interest in energy metabolism research and a growing recognition of the importance of the interrelationships of the various nutrients. Many studies have been reported on the energy intake of human beings as calculated from food intake, but there have been few published reports of energy balance experiments, that is, studies in which both the total calories obtained from food and the number lost in excreta have been determined. Caloric intake is sometimes reported as gross energy (heat of combustion in calories per gram due to the oxidation of the food to its ultimate products). The heats of combustion of the feces and urine furnish data as to the portion of the gross energy which escapes unused. The gross energy less the urinary and fecal energy is called metabolizable or utilizable energy and is the portion which is actually capable of transformation within the body. The difference between the total (gross) energy and that lost in the feces is the energy absorbed by the body, termed "digestible energy."

No studies were found in the literature dealing exclusively with energy balance of pre-adolescent children, and little research has been reported on factors which influence the retention or loss of energy in children. Holt and Fales (2) estimated the energy balance of children from dietary studies by using caloric values of food and excreta as reported in the literature. They concluded that for healthy children, a caloric loss equal to 10 per cent of the total energy intake is approximately correct. Children suffering from chronic intestinal indigestion had excretory losses ranging from 10 to 15 per cent of the total caloric intake; those with severe chronic intestinal indigestion excreted as much as 25 per cent of the total intake.

Muller, according to Holt and Fales (2), determined by direct calorimetry the caloric intake and fecal and urinary caloric losses on thirty-two preschool children. He likewise found the average caloric loss in the excreta to be 10.1 per cent of the total energy intake.

Chi Che Wang and her associates (3) determined three-day energy balances in connection with metabolism studies on undernourished children. In one study ten normal children and twenty-six undernourished children, five to thirteen years of age, were fed a weighed diet. The intake values were calculated using *Rose's Laboratory Handbook for Dietetics* (4) and the caloric value of the urine and feces was determined in the bomb calorimeter. In a second balance study on twenty-four underweight adolescent girls (5), both the caloric intake and excretory losses were determined by direct calorimetry. Regardless of whether the subjects were normal in weight or undernourished, in both studies the percentage of energy absorbed was about 95 per cent and the percentage utilized was about 91 per cent. The total number of calories utilized varied with the intake and was directly proportional to the intake. The percentage utilization, however, remained practically constant.

[1] A part of Sub-project I, Nutritional Requirements and Utilization, of the Southern Regional Research Project, S-15 on Assessments of Nutritional Status of Human Beings. Received for publication July 19, 1954.

Some of the experimental data have been taken from a thesis submitted by Paula S. Richardson in partial fulfillment of the requirements for the degree of Master of Science, Louisiana State University.

[2] Present address: University of Tennessee, Knoxville.

[3] The authors are indebted to the Agricultural Chemistry and Biochemistry Department for the use of laboratory equipment.

The most exhaustive energy balance study with children was reported by Macy and Hunscher (6). Ten children, four to nine years of age, who were normal according to numerous standards, were maintained on an energy study for forty-five consecutive balance periods of five days each. The energy intakes and losses in urine and feces were determined by direct calorimetry. They concluded that a difference of 10 calories per kilogram of body weight might be the limiting factor in visible and invisible growth in children, even if the dietary is excellent in other nutrients.

Energy balance studies of children reported by Wang *et al.* (7) and Hawks *et al.* (8) have shown that the protein content of the diet is an influential factor in energy utilization and excretion. With an increase of dietary protein, there was a decrease in calories utilized and an increase in eliminated calories, both in urine and feces. An increase in loss of nitrogenous substances was given as the reason for increase in loss of calories. Hawks and associates (8) pointed out that the higher protein in the diet increased the average per cent of calories eliminated from 7.3 to 12 per cent. Thus the subtraction of 10 per cent from the caloric intake to care for excretory losses may not always give accurate results.

EXPERIMENTAL PROCEDURE

The subjects were six healthy, pre-adolescent girls who were examined at the beginning of the experiment by a university physician. Five were from familes where the fathers were working toward advanced degrees at Louisiana State University. The other father was employed by a local industrial plant. The group included a set of eight-year-old twins; two sisters from another family, eight and eleven years of age; and two nine-year-old girls. According to Baldwin-Wood standards (9), two were within the normal level (±4 per cent) of weight deviation, and the other four were from 6 to 10 per cent underweight.

During the entire experiment, the girls lived in a home management house on the campus and were kept under constant supervision. They were weighed and measured under standard conditions at the beginning of the study and each week thereafter. The experiment covered fifty-six days and was divided into two phases, I and II, and the girls were divided equally into two groups, A and B. During each phase, the girls were fed a basal diet followed by an experimental diet. The first phase consisted of three basal periods (Basal I) followed by two experimental periods (Experimental I). The first six days of Phase I was an adjustment period, and the analytical values for those days are not included. The other two basal periods were five days each. During the basal periods of Phase I, all girls received a milk-free basal diet devoid of vitamin A and carotene, but approximately meeting the National Research Council's (10) recommendations for the other nutrients. This diet was supplemented with thiamine hydrochloride, riboflavin, and 1 gm. calcium in the form of calcium lactate. The two experimental periods (Experimental I) of Phase I were seven days each; during these periods, the basal diet was supplemented with 3600 mcg. carotene in the form of sweet potatoes. In addition, three subjects, Group A, received reconstituted dried skim milk in sufficient quantity to give 1 gm. calcium daily which replaced the calcium lactate in the basal diet.

The two basal periods of Phase II (Basal II) were of five- and seven-day durations, and the children were again fed the basal diet. The two experimental periods (Experimental II) of this phase were identical with those in the first phase except the groups were reversed and Group B received the dried skim milk.

Three menus were routinely fed during the basal period. Two of these menus, modified with sweet potatoes and dried skim milk, were alternated during the experimental periods. All diets were planned to be approximately constant in calories, protein, and fat. Known amounts of fondant, however, were allowed *ad libitum*. The higher protein and energy requirements of the eleven-year-old girl were met by feeding extra meat and fondant.

Slurries were made from one-half portions of all the food eaten each day, and aliquots were added to five- or seven-day composites and then frozen. Food refusals for each child were composited separately. Complete daily fecal collections were made, aliquots added to individual five- or seven-day pools, and then frozen. Carmine markers, which were given before breakfast at the beginning of each period, were used to separate the fecal excretions for the period. Duplicate samples of the food and fecal composites were weighed into tared aluminum moisture pans and dried in a convection oven at 70°C. for 72 hr. The samples were then cooled, weighed, and kept in a vacuum desiccator until they reached constant weight. The dried residues were finely ground with a mortar and pestle, placed in 1-oz. specimen jars, and stored over calcium sulphate in an air-tight container until energy determinations were made. For analysis, approximately 0.8 gm. of samples was made into a pellet, accurately weighed to 0.1 mg., and the caloric value determined by the standard method for the Emerson fuel calorimeter.[4]

Representative samples of the individual foods which made up the composite were dried and burned in the bomb calorimeter. This was done to compare the caloric value of a diet in which the foods are incorporated in a composite with the caloric value of

[4] This method is adapted to biologic material from the instruction manual furnished with the Emerson fuel calorimeter, manufactured by the Emerson Apparatus Company, Melrose, Massachusetts.

TABLE 1

Mean daily caloric intake, fecal caloric loss, and absorption for individual subjects during eight periods

TYPE OF REGIMEN	PERIOD	CALORIC INTAKE		FECAL CALORIC LOSS			ABSORPTION	
		Per 24 hr.	Per kilogram body weight	Total calories	Calories per kilogram	Per cent of intake	Calories per kilogram	Per cent of intake
D. P.								
Basal Phase I	2	2099	63.2	49	1.5	2.3	61.7	97.7
	3	2095	62.4	21	0.6	1.0	61.8	99.0
Experimental Phase I	4	2188	65.1	64	1.9	2.9	63.2	97.1
	5	2262	67.3	34	1.0	1.5	66.3	98.5
Basal Phase II	6	2130	63.4	39	1.2	1.8	62.2	98.2
	7	2136	63.6	53	1.6	2.5	62.0	97.5
Experimental Phase II	8	2314	68.3	69	2.0	3.0	66.3	97.0
	9	2360	69.2	55	1.6	2.3	67.6	97.7
Mean		2198	65.3	48	1.4	2.2	63.9	97.8
G. M.								
Basal Phase I	2	2144	80.0	65	2.4	3.0	77.6	97.0
	3	2038	75.5	60	2.2	2.9	73.3	97.1
Experimental Phase I	4	2075	76.9	67	2.5	3.2	74.4	96.8
	5	2139	78.4	59	2.2	2.8	76.2	97.2
Basal Phase II	6	2040	74.7	51	1.9	2.5	72.8	97.5
	7	2035	75.4	62	2.3	3.0	73.1	97.0
Experimental Phase	8	2238	82.0	66	2.4	2.9	79.6	97.1
	9	2250	82.4	60	2.2	2.7	80.2	97.3
Mean		2120	78.2	61	2.3	2.9	75.9	97.1
J. A.								
Basal Phase I	2	1997	86.8	51	2.2	2.6	84.6	97.4
	3	1952	83.4	72	3.1	3.7	80.3	96.3
Experimental Phase I	4	2145	93.3	75	3.3	3.5	90.0	96.5
	5	2256	95.6	62	2.6	2.7	93.0	97.3
Basal Phase II	6	2028	85.9	62	2.6	3.1	83.3	96.9
	7	2035	83.7	54	2.2	2.7	81.5	97.3
Experimental Phase II	8	2076	85.4	65	2.7	3.1	82.7	96.9
	9	1994	81.4	59	2.4	2.9	79.0	97.1
Mean		2060	86.9	63	2.6	3.0	84.3	97.0
L. M.								
Basal Phase I	2	1791	66.8	60	2.2	3.4	64.6	96.6
	3	1961	73.2	58	2.2	3.0	71.0	97.0
Experimental Phase I	4	2216	82.7	75	2.8	3.4	79.9	96.6
	5	2297	85.7	66	2.5	2.9	83.2	97.1
Basal Phase II	6	2028	74.3	63	2.3	3.1	72.0	96.9
	7	2052	75.2	60	2.2	2.9	73.0	97.1
Experimental Phase II	8	2076	74.9	63	2.3	3.0	72.6	97.0
	9	2042	74.8	69	2.5	3.4	72.3	96.6
Mean		2058	76.0	64	2.4	3.1	73.6	96.9
M. J.								
Basal Phase I	2	1980	79.8	52	2.1	2.6	77.7	97.4
	3	1976	79.7	52	2.1	2.6	77.6	97.4
Experimental Phase I	4	2001	80.7	54	2.2	2.7	78.5	97.3
	5	2114	84.6	57	2.3	2.7	82.3	97.3
Basal Phase II	6	2040	80.0	62	2.4	3.0	77.6	97.0
	7	2035	78.6	47	1.8	2.3	76.8	97.7
Experimental Phase II	8	2178	84.7	65	2.5	3.0	82.2	97.0
	9	2167	82.1	58	2.2	2.7	79.9	97.3
Mean		2061	81.3	56	2.2	2.7	79.1	97.3

TABLE 1—*Concluded*

TYPE OF REGIMEN	PERIOD	CALORIC INTAKE		FECAL CALORIC LOSS			ABSORPTION	
		Per 24 hr.	Per kilogram body weight	Total calories	Calories per kilogram	Per cent of intake	Calories per kilogram	Per cent of intake
				P. P.				
Basal Phase I	2	1920	74.7	79	3.1	4.1	71.6	95.9
	3	2035	78.0	65	2.5	3.2	75.5	96.8
Experimental Phase I	4	2284	87.5	84	3.2	3.7	84.3	96.3
	5	2224	84.2	80	3.0	3.6	81.2	96.4
Basal Phase II	6	2040	76.1	69	2.6	3.4	73.5	96.6
	7	2052	76.6	58	2.2	2.8	74.4	97.2
Experimental Phase II	8	2064	77.0	66	2.5	3.2	74.5	96.8
	9	2042	75.6	58	2.1	2.8	73.5	97.2
Mean		2083	78.7	70	2.7	3.4	76.0	96.6
				Entire Group				
Least significant difference (P = 0.05) among means for subjects		72.0	3.26	8.6	0.31	0.40	3.42	0.43

the same diet calculated from the energy values of the individual foods.

RESULTS AND DISCUSSION

Caloric Intake

For the entire experiment, the mean daily intake of all subjects was 2097 calories (Table 2). Within each period, the five eight- and nine-year-old girls received approximately the same number of calories, while the intake of the eleven-year-old girl was approximately 120 calories greater. The mean daily caloric intake of the group for each experimental period was greater than that for each basal period (Table 2).

The mean caloric intake per kilogram for the group was 77.7 calories (Table 2), with a range of 65.3 for *D. P.* to 86.9 for *J. A.* (Table 1). The fact that *J. A.* weighed the least, 22 kg., and was 10 per cent underweight at the beginning of the experiment accounts for her high caloric intake per kilogram of body weight. Wang *et al.* (3) found the caloric intake per kilogram of body weight to be somewhat higher for undernourished than for normal children. *D. P.*'s weight was the greatest, and although she was given extra calories, her intake per kilogram was less than that of the others. The diets were planned for regulated calories according to the recommended allowances for these age groups, without regard to differences in weight.

The caloric intake per kilogram was greater in the experimental than in the basal periods, the increase being associated with a higher total caloric intake. In Experimental Phase I, the average caloric intake per kilogram for all the girls was greater than in Experimental Phase II. Since the total caloric intakes were approximately the same, the difference in the caloric intake per kilogram was due to weight gains.

The mean daily caloric intakes of the subjects obtained by analyzing the composited diets were slightly greater, 3.0 per cent, than the caloric intakes calculated from the energy values from combustion of the individual foods which made up the diet (Table 3). The differences between the two energy values were consistent throughout the study for all subjects.

Fecal Loss

A mean daily fecal loss of 60 calories was found for the group for all periods (Table 2). The eleven-year-old subject's mean fecal caloric loss was significantly less than that of the other girls, even though her caloric intake was greater. The excretory habits of this subject differed from those of the others in that the weight of the feces was always less and the time interval between defecations was longer. The percentage moisture of her feces was also about 11 per cent less than that of the other girls.

The mean daily caloric losses were greater during the experimental periods. These differences, while not significant, reflect the increased daily caloric intake during the experimental periods. The correlation coefficient between mean daily caloric intake and fecal loss was 0.103, which was also nonsignificant.

The data in Table 1 show that, for the five younger subjects, there were slight, though significant differences in the percentage of the total caloric intake excreted in the feces. The mean daily caloric fecal loss for all the girls was 2.9 per cent of intake (Table 2). There were no significant differences in the average losses for the eight periods.

The average daily fecal losses for five of the girls ranged from 2.2 to 2.7 calories per kilogram (Table 1). The eleven-year-old girl had an average loss of 1.4 calories. These mean energy losses are lower than the 3.4 and 5.9 calories per kilogram reported by Muller (according to Holt and Fales [2]) and Wang *et al.* (3). In another study, Wang *et al.* (5) found a fecal caloric output of 2.8 calories per kilogram,

TABLE 2

The mean caloric intake, fecal caloric loss, and absorption for group during eight periods

TYPE OF REGIMEN	PERIOD	CALORIC INTAKE		CALORIC FECAL LOSS			ABSORPTION	
		Per 24. hr	Per kilogram body weight	Total calories per 24 hr	Calories per kilogram	Per cent of intake	Calories per kilogram	Per cent of intake
Basal Phase I	2	1989	75.2	59	2.3	3.0	72.9	97.0
	3	2010	75.4	55	2.1	2.7	73.3	97.3
Experimental Phase I	4	2152	81.0	70	2.7	3.2	78.3	96.8
	5	2215	82.6	60	2.3	2.7	80.3	97.3
Basal Phase II	6	2051	75.7	58	2.2	2.8	73.5	97.2
	7	2058	75.5	56	2.1	2.7	73.4	97.3
Experimental Phase II	8	2158	78.7	66	2.4	3.0	76.3	97.0
	9	2143	77.6	60	2.2	2.8	75.4	97.2
Mean for group		2097	77.7	60	2.3	2.9	75.4	97.1
Least significant difference (P = 0.05) among periods		83.0	3.77	N.S.	0.35	N.S.	4.04	N.S.

which is very close to the mean of 2.3 for these girls. Statistical evaluation of the data showed a significant correlation coefficient of 0.735 between the caloric intake and loss per kilogram. This correlation denotes that with each increase or decrease in caloric intake per kilogram, there is a corresponding increase or decrease in the caloric fecal loss per kilogram. Wang *et al.* (5) found a correlation coefficient of 0.527 between the intake per kilogram and fecal loss per kilogram.

Caloric Absorption

A direct relationship between the caloric intake and absorption on a per kilogram basis was shown by a highly significant correlation coefficient of 0.998. Hawks *et al.* (8) also found high correlations between absorption and intake, with a correlation coefficient of 0.746 for one experiment and 0.939 for another. The mean daily absorption per kilogram for all subjects and all periods was 75.4 calories (Table 2) with a range of from 63.9 to 84.3 (Table 1). It was lower in the basal periods.

The mean caloric absorption for the group was 97.1 per cent of intake. There was little variation among the absorption percentages of the subjects for the entire experiment. The values ranged from 96.6 per cent for *D. P.* to 97.8 per cent for *P. P.* The group mean percentage absorption values fluc-

TABLE 3

A comparison of the caloric intakes of individual subjects as obtained from food composite analyses and individual food analyses

SUBJECT	ANALYSIS	CALORIC INTAKE									DIFFERENCE IN MEANS
		Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8	Period 9	Mean for subject	
											%
D. P.	composite	2099	2095	2188	2262	2130	2136	2314	2360	2198	
	individual food	1967	2048	2154	2135	2069	2087	2251	2224	2117	−3.7
G. M.	composite	2144	2038	2075	2139	2040	2035	2238	2250	2120	
	individual food	2038	1966	2064	2042	1990	1993	2189	2138	2053	−3.2
J. A.	composite	1997	1952	2145	2256	2028	2035	2076	1994	2060	
	individual food	1917	1891	2152	2113	1978	1918	2046	1928	1993	−3.3
L. M.	composite	1791	1961	2216	2297	2028	2052	2076	2042	2058	
	individual food	1728	1891	2258	2198	1978	2009	2046	1994	2013	−2.2
M. J.	composite	1980	1976	2001	2114	2040	2035	2178	2167	2061	
	individual food	1910	1906	1986	2024	1990	1993	2137	2061	2001	−2.9
P. P.	composite	1920	2035	2284	2224	2040	2052	2064	2042	2083	
	individual food	1854	1962	2283	2125	1990	2009	2034	1994	2031	−2.5
Group	composite	1989	2010	2152	2215	2051	2058	2158	2143	2097	
	individual food	1902	1944	2150	2106	1999	2002	2117	2057	2035	−3.0

tuated even less among periods, 96.8 per cent for Period 4 to 97.3 for Periods 3, 5, and 7 (Table 2).

The figure on mean caloric absorption, 97.1 per cent, is higher than the average values reported (2, 3, 5, 8, 11), which ranged from 94.3 to 96.0 per cent. The specially controlled diet these girls received probably accounts for the higher figure. The diet contained a large amount of highly digestible animal protein and little roughage or indigestible materials.

SUMMARY

The energy absorption was determined for six pre-adolescent girls living on a controlled dietary regimen for fifty-six days. Aliquots of the food eaten and feces excreted were collected daily. The composites were frozen until samples of the food and feces were dried and analyzed for caloric value in the Emerson fuel calorimeter. From these analyses, the caloric intake and caloric loss for each girl for each of the eight periods were determined.

The mean daily intake for all the subjects for the entire experiment was 2097 calories. The average fecal loss was 60 calories. No direct relationship was found between mean daily total caloric intake and fecal loss. A direct relationship, however, existed between the caloric intake and loss per kilogram. The mean daily caloric intake per kilogram for the group was 77.7 calories, and the average loss was 2.3 calories, giving a mean daily absorption of 75.4 calories per kilogram. A direct relationship existed between the caloric intake per kilogram and the caloric absorption per kilogram as shown by a highly significant correlation coefficient of 0.998. The mean caloric loss for the group was 2.9 per cent of the intake, and the mean caloric absorption was 97.1 per cent. The values for percentages of calories absorbed by the subjects were fairly constant, 96.6 to 97.8, regardless of total intake.

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Sanitizing Plastic Tableware

Studies at Michigan State College indicate that the cleaning and sanitizing of Melamine plastic ware can be as effective as of vitreous china ware. In the October issue of *Modern Sanitation*, W. L. Mallmann, David Kahler, and Frederick Butt report that no significant difference was found between the plastic and vitreous china in the number of viable organisms left after moist heat sanitation. Comparisons were made after rinsing at 170°F. for 10 seconds with a flow rate of 1½ gal. water per 10-second period in a 20-in. tray in a single-tank, door-type dishwashing machine.

Plastic, glass, and china dishes showed similar behavior in relation to the survival of bacterial populations occurring on their surfaces. Food soils, too, were removed, for practical purposes, to the same degree from both plastic and china surfaces.

In tests of relative wetting characteristics, the plastic showed a somewhat greater tendency than china toward droplet formation. This was, however, reduced to a practical minimum by the use of detergents incorporating a wetting agent. A difference in drying time was also noted between china and old plastic. New plastic dried in approximately the same time as china.

On prolonged use with coffee or tea, both plastic and china were stained, but the latter to a somewhat lesser degree. For either material, this problem can be reduced to a practical level by the use of proper mechanical dishwashing coupled with selection of effective detergents (those containing oxidizing agents) and bleaching dips. Tea and tea with cream stained both china and plastic much more rapidly than coffee and coffee with cream.

Under conditions prevailing in normal use, including mechanical dishwashing, formaldehyde was not released from Melamine plastic ware in amounts detectable by present test methods. Even under very drastic conditions, the amounts released were far less than occur in many common foodstuffs.

Distribution of Calories in Diets of Iowa School Children[1]

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PRACTICAL dietary plans revolve around the use of specific foods and food groups. However, the actual significance of various food groups to the adequacy of diets is not entirely understood. Gross evaluation of the nutritive quality of diets is often based on an estimation of the kinds and amounts of certain foods contained in the diet. Further information about the use of foods by well-sampled populations may aid in the interpretation and use of current daily food guides.

Based on these considerations, a study was made of the distribution of calories among certain foods and food groups in the diets of a state-wide sample of 1188 Iowa school children, ages six through eighteen years. An effort was also made to determine whether diets of three levels of adequacy differed in content as regards food groups.

The sample, the methods of obtaining dietary records, the nutritive value of the diets, and the physical measurements of the children have been described (1–3). The diets were classified as follows according to level of adequacy: Class I, those which contained all nutrients in amounts not less than 100 per cent of the Recommended Dietary Allowances of the National Research Council (4); Class II, those in which some nutrients were present in amounts less than 100 per cent of the allowances but none was less than 67 per cent; Class III, those which contained at least one nutrient in an amount less than 67 per cent of the allowances. The distribution of the children with respect to these classifications, the nutritive value of the diets of the classes at the two extremes, and the physical and biochemical measurements of the children have been presented (5).

The mean daily caloric value of the diet of each child was subdivided into calories from certain foods and food groups as shown in Table 1, which presents the means computed from the seven-day dietary records of the children of the various age-sex groups. The percentage distribution of the total calories among the food groups was also computed for the means and is shown in Table 2.

Because of the special significance which may be attached to certain foods, such as desserts, concentrated sweet foods, and meat substitutes, the groups selected for study do not conform exactly to the "Basic 7." Moreover, it is recognized that the classification of foods in the various groups might vary with the judgment of the classifier. In this classification the common use of the foods was considered. The values assigned were those of the food as served. For example, vegetables may include a small amount of fat as seasoning. The figures are, therefore, more significant on a comparative than on an absolute basis.

DISTRIBUTION OF CALORIES

Of the boys, only those of sixteen and seventeen years averaged daily the number of calories from milk which is equivalent to the amount furnished by 1 qt. At other ages, boys received from 500 to about 550 calories from this food, or from 3.0 to 3.3 cups daily. Girls had 375 to 500 calories from milk, or 2.2 to 3.0 cups. Teen-age boys used more milk than younger boys, but adolescent girls, particularly after fourteen, used less milk than younger girls. Girls of fifteen and older averaged less than 3 cups daily. At each age, girls had lower intakes of milk than boys (Table 1).

The average number of calories from meat was sufficient at each age to indicate an intake of one

[1] Contribution No. 15, Sub-project 2, "The Nutritional Status of School Children: The School Lunch as an Influencing Factor" of the North Central Region Cooperative Project NC-5, "Nutritional Status and Dietary Needs of Population Groups." (a) Human Nutrition Research Branch of the Agricultural Research Service, U. S. Department of Agriculture, and (b) Iowa Agricultural Experiment Station, Ames. Journal Paper No. J-2559, Project 1021. Supported in part by a grant and other assistance from General Mills, Inc., as part of its nutrition education program. Received for publication October 1, 1954.

TABLE 1

Distribution of calories in mean daily diets among food groups

AGE	NUMBER OF CHILDREN	CALORIES											
		Milk*	Green and yellow vegetables and fruits†	Ascorbic acid-rich fruits and vegetables‡	Other fruits and vegetables	Meat, etc.§	Legumes and meat substitutes	Eggs	Table fats	Desserts¶	Sweet foods	Cereals	Average total daily intake
Boys													
yr.													
6	37	539	41	52	320	222	93	48	145	233	118	391	2202
7	56	505	43	46	267	197	104	66	174	242	113	410	2167
8	54	572	43	55	254	236	100	66	161	257	114	420	2278
9	53	512	56	54	279	233	128	71	204	276	139	483	2435
10	60	501	49	45	295	256	118	74	198	256	134	490	2416
11	50	538	46	55	340	287	119	64	198	272	168	524	2611
12	91	532	57	54	338	325	137	89	213	317	151	525	2740
13	45	523	45	66	384	306	146	115	263	304	136	589	2877
14	39	508	54	51	398	411	118	92	272	371	185	626	3086
15	32	551	54	54	440	386	116	119	289	388	240	616	3253
16	31	650	66	66	434	412	112	106	279	475	209	611	3420
17	21	735	82	62	427	400	162	157	258	335	182	599	3399
18+	17	584	38	59	333	492	134	134	282	438	272	652	3418
Girls													
6	50	444	41	44	249	196	88	70	152	207	94	378	1963
7	48	425	38	50	289	232	90	77	159	179	108	339	1986
8	43	502	38	49	262	191	79	56	157	202	107	382	2025
9	62	442	43	53	295	252	129	73	178	258	129	423	2275
10	62	414	58	60	330	232	96	72	191	261	137	428	2279
11	58	465	43	54	297	242	134	55	168	230	149	423	2260
12	84	469	56	52	320	312	138	62	194	326	153	486	2568
13	44	438	56	43	333	259	138	61	194	327	120	503	2472
14	37	453	49	54	360	286	122	67	200	286	145	464	2486
15	39	405	55	62	368	325	124	71	197	396	146	444	2593
16	36	394	52	65	284	341	89	59	167	345	139	376	2311
17	26	378	54	67	352	350	102	53	155	347	128	387	2373
18+	13	374	60	62	387	338	95	51	200	288	146	418	2419

* Includes milk in foods and equivalent in dairy products.

† Carotenoid-rich fruits and vegetables.

‡ Citrus fruits, tomatoes, raw cabbage, cantaloupes, berries.

§ Includes poultry and fish.

¶ Desserts not predominantly milk, fruits, or eggs.

serving or more daily. Legumes and meat substitute dishes were also liberally used.

The mean daily cereal intake for boys increased from 391 calories at six years to 626 at fourteen, or from the equivalent of 6 to 10 slices of bread. It remained at a high level in the later teens. For girls, the intake of this food ranged from approximately 350 calories at six and seven years to 503 at thirteen, but after this age tended to decrease.

The mean daily intake of sweet foods, such as candy and soft drinks, for boys ranged from approximately 110 calories at six, seven, and eight to 200 or more at fifteen years and older, and for girls from 100 calories at six, seven, and eight to approximately 150 at fourteen, fifteen, and eighteen with somewhat smaller amounts for the sixteen and seventeen year olds. Boys averaged 250 to 475 calories from desserts, not composed mainly of milk, eggs, and fruit; corresponding figures for girls were 200 to 400.

Approximately 50 calories daily were obtained from each of the two vitamin-rich groups of fruits and vegetables, and 250 to 400 calories from other fruits and vegetables. These figures may include some calories contributed by seasoning and dressings. Previous inspection of the diets showed them to include daily about ⅓ serving of the green and yellow vegetables and fruits; about ½ serving of the ascorbic acid-rich fruits and vegetables; and approximately 3 servings of other fruits and vegetables, including potatoes.

PERCENTAGE DISTRIBUTION OF CALORIES

The percentage of total calories from milk in the mean daily diets ranged around 20; it was slightly higher for the six-, seven-, and eight-year-old children, but lower for the teen-agers (Table 2).

The total vegetables and fruits afforded about 13 to 19 per cent of the calories in the diets of the boys and 17 to 21 per cent in those of the girls.

TABLE 2

Percentage distribution of calories among food groups

AGE	CALORIES													
	Milk	Fruits and vegetables				Protein-rich foods				Energy-rich foods				
		Green and yellow vegetables and fruits	Ascorbic acid-rich fruits and vegetables	Other fruits and vegetables	Total	Meat, etc.	Legumes and meat substitutes	Eggs	Total	Table fat	Desserts	Sweet foods	Cereals	Total
Boys														
yr.	%	%	%	%	%	%	%	%	%	%	%	%	%	%
6	24.4	1.9	2.4	14.4	18.7	10.1	4.2	2.2	16.5	6.7	10.6	5.4	17.7	40.4
7	23.3	2.0	2.1	12.3	16.4	9.1	4.8	3.0	16.9	8.0	11.2	5.2	18.9	43.3
8	25.0	1.9	2.4	11.2	15.5	10.4	4.4	2.9	17.7	7.1	11.3	5.0	18.4	41.8
9	21.0	2.3	2.2	11.5	16.0	9.6	5.3	2.9	17.8	8.4	11.3	5.7	19.8	45.2
10	20.6	2.0	1.9	12.2	16.1	10.6	4.9	3.1	18.6	8.2	10.6	5.6	20.3	44.7
11	20.6	1.8	2.1	13.0	16.9	11.0	4.6	2.4	18.0	7.6	10.4	6.4	20.1	44.5
12	19.4	2.1	2.0	12.3	16.4	11.9	5.0	3.2	20.1	7.8	11.6	5.5	19.2	44.1
13	18.2	1.6	2.3	13.3	17.2	10.6	5.1	4.0	19.7	9.1	10.6	4.7	20.5	44.9
14	16.5	1.8	1.6	12.9	16.3	13.3	3.8	3.0	20.1	8.8	12.0	6.0	20.3	47.1
15	16.8	1.7	1.7	13.5	16.9	11.9	3.6	3.7	19.2	8.9	11.9	7.4	18.9	47.1
16	19.0	1.9	1.9	12.7	16.5	12.0	3.3	3.1	18.4	8.2	13.9	6.1	17.9	46.1
17	21.5	2.4	1.8	12.6	16.8	11.8	4.8	4.6	21.2	7.6	9.9	5.4	17.6	40.5
18+	17.1	1.1	1.7	9.7	12.5	14.4	3.9	3.9	22.2	8.2	12.8	8.0	19.1	48.1
Girls														
6	22.6	2.1	2.2	12.7	17.0	10.0	4.5	3.6	18.1	7.7	10.5	4.8	19.3	42.3
7	21.4	1.9	2.5	14.6	19.0	11.7	4.5	3.9	20.1	8.0	9.0	5.4	17.1	39.5
8	24.7	1.9	2.4	12.9	17.2	9.4	3.9	2.8	16.1	7.8	10.0	5.3	18.9	42.0
9	19.4	1.9	2.3	13.0	17.2	11.1	5.7	3.2	20.0	7.8	11.3	5.7	18.6	43.4
10	18.2	2.5	2.6	14.5	19.6	10.2	4.2	3.2	17.6	8.4	11.4	6.0	18.8	44.6
11	20.6	1.9	2.4	13.1	17.4	10.7	5.9	2.4	19.0	7.4	10.2	6.6	18.7	42.9
12	18.2	2.2	2.0	12.5	16.7	12.2	5.4	2.4	20.0	7.6	12.7	6.0	18.8	45.1
13	17.7	2.3	1.7	13.5	17.5	10.5	5.6	2.5	18.6	7.8	13.2	4.8	20.4	46.2
14	18.2	2.0	2.2	14.5	18.7	11.5	4.9	2.7	19.1	8.0	11.5	5.8	18.7	44.0
15	15.6	2.1	2.4	14.2	18.7	12.5	4.8	2.7	20.0	7.6	15.3	5.6	17.1	45.6
16	17.0	2.2	2.8	12.3	17.3	14.8	3.8	2.6	21.2	7.2	14.9	6.0	16.3	44.4
17	15.9	2.3	2.8	14.8	19.9	14.8	4.3	2.2	21.3	6.5	14.6	5.4	16.3	42.8
18+	15.4	2.5	2.6	16.0	21.1	14.0	3.9	2.1	20.0	8.3	11.9	6.0	17.3	43.5

Together milk, fruits, and vegetables provided from 30 to 43 per cent of the daily caloric intake. The percentage of calories derived from the combined protein-rich foods, exclusive of milk and cereals, varied from approximately 16 to 22 per cent.

Cereals, including bread and breakfast foods, contributed 16 to 20 per cent of the calories with a tendency toward a slightly smaller proportion for girls than for boys. Except for the seven-year-old girls, these percentages were lowest for girls over fourteen. The proportion of calories obtained from desserts and sweet foods combined tended to increase with age, and the trend was more noticeable for girls than for boys; after fifteen, the girls obtained as much as 20 per cent of their total calories from these foods, or considerably more than they obtained through milk. From 7 to 9 per cent of the calories were derived from table fats.

Thus, milk, fruits, vegetables, meat, and eggs provided 52 to 60 per cent of the calories in the mean daily diets, while cereals, desserts, sweet foods, and fats furnished 40 to 48 per cent.

FOOD USE AND DIETARY CLASSIFICATION

The use of foods and food groups by the children with diets of the three classifications differed in some respects (*Fig.* 1). For this comparison, the data were combined in four age groups.

Iowa boys with diets meeting or exceeding the recommended allowances (Class I) obtained on the average 4 cups or more of milk daily, and girls had 3 to 4 cups. At the other dietary extreme (Class III), boys averaged 2 to 3 cups, and girls 2 cups. At each age, the children with diets intermediate in adequacy (Class II) were also intermediate in their milk consumption. The same relationships were observed in the total intake of calories from vegetables and fruits. The consumption of the ascorbic acid- and the carotenoid-rich fruits and vegetables was usually highest for the children of Class I, intermediate in Class II, and lowest in Class III.

The greatest differences between the diets of Classes I and III were in the use of milk, the ascorbic acid-rich foods, and the green and yellow

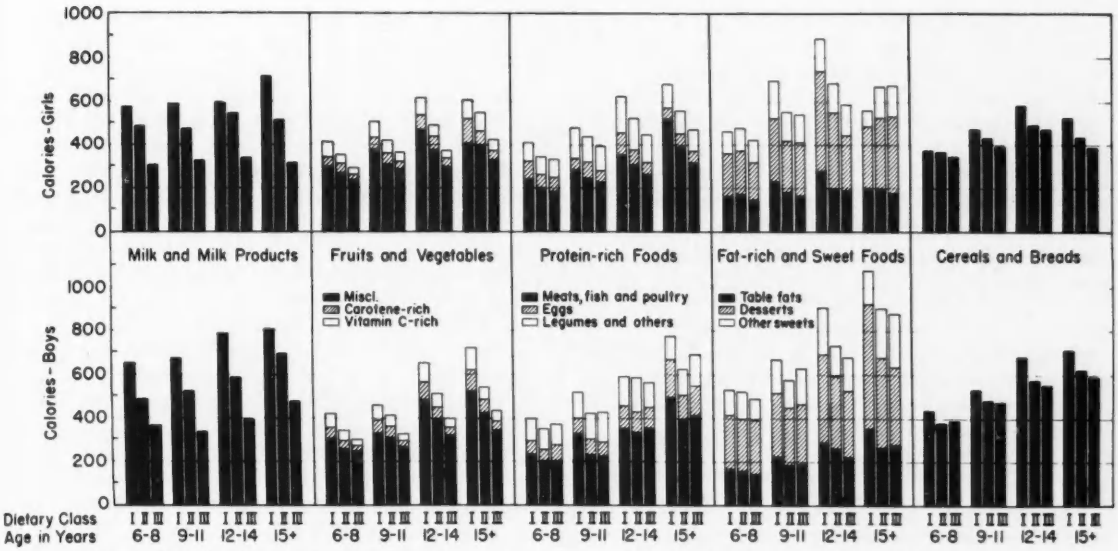

FIG. 1. *Distribution of calories among food groups in daily diets. See text for description of dietary classes.*

vegetables and fruits. The consumption of foods of these groups by the children of Class III was about 50 per cent less than that by Class I. Over all the ages, the boys of Class III used on the average 46 per cent less milk than those of Class I, 53 per cent less of the green and yellow vegetables, and 54 per cent less of the ascorbic acid-rich vegetables and fruits. The corresponding differences for girls were 47, 39, and 48 per cent. Differences in the calories from the "other fruits and vegetables" were less pronounced than those in the special groups of fruits and vegetables.

Thirty-two per cent of the boys and 40 per cent of the girls had diets with one nutrient below 67 per cent of the allowances (5). Apparently an increase of approximately 100 per cent is needed in the use of milk, the green and yellow vegetables and fruits, and the ascorbic acid-rich fruits and vegetables of at least one-third of these Iowa school children if they are to have diets which conform to the recommended allowances.

The children whose diets met or exceeded the allowances tended to have more calories from meats and cereals than had those with diets of the lowest classification. The intake of these foods by the intermediate group was variable, particularly for the boys.

In calories from meat substitutes, eggs, sweet foods, and desserts, the diets of the three classifications did not differ consistently, but some of the observations regarding the use of desserts and sweet foods are noteworthy. Girls of fifteen years and over with the most nutritious diets evidently consumed fewer sweet foods, such as candy, soft drinks, and desserts, than did the girls with less adequate diets. The calculated diets of the girls of this age were notably low in nutrient content (2). It seems possible that a relatively high consumption of desserts and sweets may be one of the factors contributing to the teen-age girls' poor diets. Except for this age group, however, there was no evidence that a large consumption of sweet foods, including desserts, was peculiar to diets low in nutrient content. In fact, it might be said for boys of age twelve and older and for girls age twelve to fourteen (and possibly nine to eleven), the dietary classification varied positively with the consumption of sweet foods.

TABLE 3

Percentage distribution of calories among food groups in diets of two classifications

FOOD GROUP	PERCENTAGE OF CALORIES			
	Girls		Boys	
	Class I (82 subjects)	Class III (248 subjects)	Class I (141 subjects)	Class III (184 subjects)
Milk	22.7	15.6	23.8	16.1
Green and yellow vegetables and fruits	2.2	1.8	2.2	1.4
Ascorbic acid-rich fruits and vegetables	2.9	2.1	2.6	1.5
Other fruits and vegetables	13.6	13.9	12.3	12.0
Meat, etc.	11.0	12.1	10.6	12.3
Legumes and meat substitutes	4.6	5.0	3.9	4.9
Eggs	2.7	2.8	2.8	3.9
Table fat	7.7	8.1	7.7	8.5
Desserts	10.3	12.8	10.8	12.1
Sweet foods	5.1	6.4	5.0	6.8
Cereals	17.1	19.4	18.2	20.5

The diets of the children of Class III were considerably lower in total calories than were the diets of Class I, but the use of all the food groups was not proportionately low. The percentage distribution of calories among the food groups was different in the highest and lowest classifications (Table 3).

The diets of Class I had a considerably larger proportion than those of Class III of calories from milk and a slightly larger proportion of calories from the carotene- and the ascorbic acid-rich fruits and vegetables. Class III diets, on the other hand, had a slightly larger proportion than Class I of calories from cereals, sweet foods, table fats, desserts, and protein-rich foods. Diets which failed to conform to the allowances tended to emphasize the energy-rich foods and to restrict the use of milk and the vitamin-rich fruits and vegetables.

SUMMARY AND CONCLUSIONS

The distribution of food energy value of the diets of Iowa children among food groups has been presented. Approximately 55 to 60 per cent of the calories in the mean daily diets were obtained from milk, fruits, vegetables, meats, and eggs, whereas 40 to 45 per cent was derived from cereals, desserts, sweet foods, and fats. Since these foods comprise a substantial portion of the diet of Iowa school children, considerable attention should be focused on the enhancement of their total nutritive value. At few ages did the average caloric consumption from milk indicate the widespread use of 1 qt. a day; the daily average varied from 2.2 to 3.3 cups for all the age-sex groups.

Some small differences in percentage distribution of calories among food groups at different ages denote changes in use of food groups as children grow older. The most conspicuous of these was a decrease by teen-age girls in the percentage of calories from milk and cereals.

The diets which fully met the Recommended Dietary Allowances for all nutrients were higher than those which failed to meet the allowances both in the actual calories provided by milk, fruits, and vegetables and in the percentage of the total caloric intake provided by these food groups. The differences, percentage-wise, were particularly marked for the ascorbic acid- and the carotene-rich fruits and vegetables. The diets of highest nutritional quality usually contained larger amounts of meats and cereals but a smaller percentage of total calories. No consistent relationships were observed between the levels of dietary adequacy and the use of desserts, sweet foods, or meat substitutes; but late teen-age girls with diets in the lowest nutritional category had more calories from sweet foods and desserts than had those with totally adequate diets.

Diets which met or exceeded the allowances included an average of 4 cups milk daily for boys and 3 to 4 cups for girls, plus liberal amounts of fruits and vegetables, meats, and cereals. The diets of lowest classification differed from the highest both in total calories and in distribution of the calories among the food groups.

The diets of at least one-third of these Iowa school children should include 100 per cent more milk, ascorbic acid-rich fruits and vegetables, and green and yellow vegetables and fruits, if they are to meet the recommended allowances.

The food practices of children whose diets met or exceeded the allowances conformed in the main to current food guides.

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Richest Source of Ascorbic Acid

The acerola tree, commonly known as the Puerto Rican cherry or West Indian cherry, has been reported by the *Journal of the American Medical Association* [Vol. 156: 1501 (December 18) 1954] to be the richest known source of ascorbic acid. The tree grows semi-wild in the Caribbean area, where natives say that a tree in the back yard will "keep colds out of the front door." Assays indicate that a 6-oz. glass of juice from the fruit of the acerola tree contains as much as 8650 mg., more than eighty-five times as much as a 6-oz. glass of fresh orange juice.

Although the fruit's amazing vitamin value was first discovered by Dr. Conrad F. Asenjo in 1945, it was not until 1949 that Harvey Greenspan, Miami orange juice millionaire, became interested in developing the tree's commercial possibilities. Last spring the first commercial crop was finally produced, after an expenditure of a quarter of a million dollars on the project.

The first product of the fruit to be marketed will be C-rola juice for infant food. The enrichment of soft drinks with C-rola juice rather than with chemicals is also envisioned, as is its use with apple juice or pear juice.

Calcium and Phosphorus Utilization in Older Men[1]

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DURING the course of studies on the effects of varied breakfasts and "no breakfast" regimens on certain physiologic responses of a group of older men (1), data were collected on the utilization of nitrogen, calcium, and phosphorus. Findings on nitrogen utilization have been reported previously (2). This paper deals with the calcium and phosphorus utilization.

The subjects in this study consisted of a group of seven men varying in age from fifty-three to eighty-three years. Physical examination showed that all the subjects were in good physical condition commensurate with their age. All were active, four being employed full time, one part time, and two retired. The two retired men were living on old age retirement funds. The entire group was most cooperative and ate the varied diets with no complaints as to gastrointestinal discomfort.

Since the experimental procedures have been described in detail previously (1, 2), they are stated only briefly here. After a period of free choice of food in the hospital cafeteria, weighed diets reflecting these choices were prepared for the following periods covering nine months:

Basic bacon, egg, and milk breakfast period
"No breakfast" period
Basic cereal and milk breakfast period

The basic breakfasts provided one-fourth of the total daily caloric and protein allowance. The basic breakfast pattern has been described previously.

During the "no breakfast" period, food was not eaten between 6 P.M. and noon on the following day, and the daily food allowance was eaten in two meals instead of three.

The total caloric intake of each subject was adjusted so that no marked weight changes occurred during the experiment. Four weeks were allowed for adjustment before data were collected, with four weeks between the experimental periods. Since collection of urinary and stool specimens for longer than one week proved impracticable, collections were made only during the fourth week of each experimental period. Aliquots of each day's food were prepared for analysis during each collection period. Milk and ice cream were analyzed separately. Standard methods of analysis were used in all cases (3, 4).

Table 1 is a summary of the data for the seven subjects during the three experimental periods. The intakes both of calcium and phosphorus were very liberal for all subjects during the entire experiment. The daily calcium intake varied from 1.463 to 2.621 gm., or from 20 to 30 mg. per kilogram of body weight. These intakes are far more liberal than in studies reported previously. The individual subjects maintained a relatively constant intake throughout the experiment.

It is evident from an examination of the data on retention, that the presence of liberal amounts of calcium and other nutrients in the diet does not necessarily lead to larger calcium retention by the adult. All subjects except Nos. *2* and *7* remained in positive calcium balance during all experimental periods. These two men were in negative calcium balance during the bacon-egg-and-milk period. Although values for mean calcium balance were less during the bacon-egg-and-milk period than during the other breakfast periods, the differences are not significant. The question of adjustment may be a factor in the lower retention values during the bacon-egg-and-milk period since the first collections

[1] This work was generously supported by a grant from the Cereal Institute, Inc., Chicago. Received for publication November 4, 1954.

TABLE 1

Calcium and phosphorus utilization by older men

SUBJECT	CALCIUM				PHOSPHORUS			
	Average intake	Average excretion		Average balance	Average intake	Average excretion		Average balance
		Urine	Feces			Urine	Feces	
Bacon-Egg-and-Milk Breakfast								
	gm./day	*gm./day*	*gm./day*	*gm./day*	*gm./day*	*gm./day*	*gm./day*	*gm./day*
1	1.463	0.372	1.049	0.042	1.607	0.923	0.618	0.067
2	1.571	0.163	1.419	−0.011	1.892	0.969	0.934	−0.011
3	2.323	0.124	2.005	0.194	2.646	1.392	0.897	0.357
4	1.926	0.175	1.727	0.024	2.324	1.129	1.160	0.035
5	1.526	0.318	1.017	0.191	1.921	1.224	0.659	0.038
6	2.007	0.340	1.566	0.105	2.110	1.094	0.950	0.066
7	1.507	0.102	1.509	−0.104	1.894	0.736	1.132	0.026
Mean	1.760	0.228	1.470	0.062	2.056	1.067	0.907	0.082
No Breakfast Routine								
1	1.543	0.327	0.889	0.327	1.733	0.862	0.578	0.292
2	1.715	0.202	1.458	0.055	1.826	0.977	0.700	0.149
3	2.226	0.170	1.979	0.077	2.574	1.319	0.991	0.264
4	2.262	0.204	1.733	0.325	2.567	1.217	1.121	0.229
5	1.641	0.256	1.079	0.305	1.948	1.415	0.522	0.011
6	2.141	0.311	1.727	0.103	2.440	1.197	1.201	0.042
7	1.621	0.137	1.013	0.471	1.888	0.692	1.061	0.135
Mean	1.878	0.229	1.411	0.238	2.139	1.097	0.882	0.160
Cereal-and-Milk Breakfast								
1	1.637	0.397	0.961	0.279	1.640	0.830	0.494	0.316
2	1.503	0.169	1.148	0.186	1.797	0.982	0.744	0.071
3	2.621	0.104	2.175	0.343	2.771	1.457	1.026	0.288
4	2.237	0.217	1.782	0.238	2.639	1.230	1.360	0.049
5	1.557	0.262	0.971	0.324	1.924	1.197	0.794	−0.067
6	2.431	0.357	1.970	0.104	2.592	1.250	1.304	0.038
7	1.541	0.115	1.290	0.136	1.879	0.506	1.031	0.342
Mean	1.932	0.231	1.471	0.230	2.177	1.064	0.964	0.148

for all subjects, after the four-week period of adjustment, were made during this period.

Nicolaysen and co-workers (5) emphasize the individual variations in ability to adjust to differences in intake, particularly after periods of poor intake. Four of the subjects (Nos. *1*, *2*, *3*, and *7*) had poor dietary histories of several years standing, particularly with regard to milk.

The mean individual urinary calcium and phosphorus excretions and group averages for all breakfast periods studied are shown in Table 2. These are slightly lower than those found for younger men during a similar experiment (6). The amount of urinary calcium excreted by the subjects was low, with two very low values. However, each subject maintained approximately the same level throughout the experiment.

Knapp (7) pointed out that urinary calcium is an individual factor dependent on the endogenous factor or factors. Nicolaysen and co-workers (5) have recently reaffirmed this statement. They also observed that urinary calcium reaches its peak between ages fifty to fifty-nine and decreases thereafter.

Nicolaysen *et al.* (5) discussed other factors which influence urinary calcium. Over a long period of time, the urinary calcium appears as an individual constant but variations do occur with changes in intake. The speed and amount of these changes vary from individual to individual and to a lesser extent in the same person.

Another factor which has been reported to affect urinary calcium to some extent and fecal calcium more, is the amount of phosphorus in the diet (5). An increase in phosphorus intake above the 1-gm. level depresses both urinary calcium and phosphorus and increases fecal calcium and phosphorus.

All subjects in this experiment consumed diets containing more than 1 gm. phosphorus per day, with the Ca:P ratio either 1:1 or 1:1.2. Little is known, either, about the phosphorus requirement or factors which affect its retention. It is assumed that if the diet is adequate in calcium and protein, phosphorus needs will be met.

TABLE 2

Mean calcium and phosphorus intakes and excretions of seven older men during three breakfast regimens

SUBJECT	MEAN INTAKE	MEAN EXCRETION		MEAN BALANCE
		Urine	Feces	
Calcium				
	gm./day	*gm./day*	*gm./day*	*gm./day*
1	1.548	0.365	0.966	0.216
2	1.596	0.178	1.342	0.077
3	2.390	0.133	2.053	0.205
4	2.142	0.199	1.747	0.196
5	1.575	0.279	1.022	0.273
6	2.193	0.336	1.754	0.103
7	1.556	0.118	1.271	0.168
Mean	1.857	0.229	1.451	0.177
Phosphorus				
1	1.660	0.872	0.563	0.225
2	1.838	0.976	0.793	0.069
3	2.664	1.389	0.971	0.303
4	2.510	1.192	1.214	0.104
5	1.931	1.279	0.658	−0.006
6	2.381	1.180	1.152	0.049
7	1.887	0.645	1.745	0.168
Mean	2.124	1.076	0.918	0.130

As shown by Table 1, two negative phosphorus balances appeared, one during the bacon-egg-and-milk period and one in the cereal-and-milk period. Individual retentions as well as the averages for the group were somewhat lower in the bacon-egg-and-milk regimen than in the other two breakfast periods. However, the differences were not significant.

The amount of urinary phosphorus tended to be about 50 per cent of the intake. Subject *5* excreted as much as 66 per cent and Subject *7*, as little as 34 per cent of the phosphorus in the urine. Both had a 1:1.2 Ca:P ratio in the diet. On lower phosphorus levels, urinary excretion tends to be above 50 per cent of the intake.

SUMMARY AND CONCLUSIONS

Calcium and phosphorus utilization values during three breakfast regimens have been presented for seven men ranging in age from fifty-three to eighty-three years. Calcium intakes were liberal, ranging from 1.463 to 2.621 gm. Phosphorus intakes also were very liberal, varying from 1.607 to 2.771 gm.

The data presented justify the following conclusions:

Positive calcium retentions were found in all subjects during both cereal-and-milk and the "no-breakfast" periods. Two subjects showed negative calcium balance in the bacon-egg-and-milk breakfast period. The most consistent values were found with the cereal-and-milk regimen.

Calcium retentions in these older men were of slightly less magnitude than those observed in a group of young men in a similar experiment. However, the differences were not statistically significant.

Urinary calcium values were relatively low for the older group, but were relatively constant for each individual.

Phosphorus retentions were positive in all periods except one negative balance in the bacon-egg-and-milk period and one in the cereal-and-milk period. The most consistent phosphorus retentions were in the "no-breakfast" period.

On the basis of group means, the daily intakes and balances for calcium and phosphorus were not significantly different in the breakfast regimens studied.

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Dangers of Rare Beef

While trichinosis is undoubtedly the most important parasitic disease of man in the U. S., infestation of the population with the beef tapeworm may be more common than is generally realized. Out of the 12 to 15 million head of cattle and 5 to 7½ million calves killed annually in this country under federal meat inspection in the past six years, from 16,500 to more than 27,000 animals have annually been revealed to be infested with this tapeworm. With the current tendency to eat rare beef, this could lead to considerable infestation of human beings.

Current Comment

Our Responsibilities to the Dietetic Intern[1]

ERCEL S. EPPRIGHT, PH.D.

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Objectives are to education as protein is to nutrition. The word protein, you recall, was derived from Greek words meaning "of first importance." Objectives in a sense furnish the blueprint with which to structure the educational program. From them we may define and delineate our responsibilities. Objectives, then, should constitute our first consideration.

Fortunately, we have an excellent statement of objectives (1) for the dietetic intern prepared by Marjorie White with the cooperation of the Committee on Objectives for the Dietetic Internship, members of the Professional Education Section, and a "jury" selected from among the internship directors. These objectives are unique in the manner in which they were derived and should be very useful to the internship director in the training of the dietetic intern. They are stated in terms of abilities. The dietetic intern:

(a) Develops (or should develop) a growing appreciation of the scope of dietetics and its contribution to society.

(b) Uses (or should use) his or her education, training, and personal abilities in the service of the profession.

(c) Shows integrity and loyalty to the ideals of the profession.

(d) Establishes effective relations with people in his or her organization and in the community.

(e) Develops technical skills and managerial ability in all areas of dietetics.

(f) Recognizes and solves problems related to the effectiveness of the work of the dietary department.

(g) Maintains a continuous program of personal and professional growth.

This is a simplified statement of the expectations of the dietetic profession of its initiates. Dietetic interns might indeed be overwhelmed by it. We also may be overwhelmed, because it is our job to design the educational program which will produce this professional paragon.

Objectives are easier to make than to use. Files are bulging with them. However, I hasten to say that I am confident that no group will be more serious than the dietetic profession in trying to carry out accepted objectives. Perhaps one of our basic needs is for better coordination of efforts between the colleges and the internships in doing this. I shall attempt in this paper to discuss some trends in the college education which may have a bearing on the achievement of these goals. These trends will change the focus of our training somewhat, and perhaps present internship directors with different problems.

Producers of goods sometimes say no product is better than the raw material which goes into it. Despite our concern about present-day youth, my observations lead me to say that our raw material is excellent. We have a highly selected group of young people with whom to work. Each year I am impressed anew with the interest and enthusiasm with which they embark on their college life. They are eager to learn and serious in their intent to qualify for responsibility in the affairs of this world and in their chosen fields.

True, among our new college students we sometimes detect gaps in the high school education. Possibly our responsibilities might even include a consideration of the high school training. Girls are often handicapped in their preparation to become dietitians by lack of elementary and high school mathematics. College entrance requirements for mathematics are notably low for home economics students. Many of our problems with chemistry stem from this lack. Incompetence in mathematics may also be one of the reasons for our thin ranks among graduate students. If we believe this, we should look critically at the college entrance requirements in home economics and perhaps use our influence to strengthen them.

One of the principal problems in the undergraduate education of the dietitian is the ever-widening scope of subject matter envisioned as necessary to produce a good citizen, an educated person, a homemaker, and a dietitian. As the function of education broadens, more courses are added, electives are squeezed out, and finally total credits for graduation are increased. But the solution is in sight.

On examination of the seven objectives for the dietetic intern given above, you will see that they may be further simplified to the statement that we expect her (or him) to have technical knowledge, skill, judgment, vision, the spirit of service, the ability to get along well with people, and an urge for

[1] Presented before the Conference of Directors and Staffs of Approved Dietetic Internships in Philadelphia, on October 23, 1954.

continued study and professional growth. These are strikingly similar to many of the objectives often recognized for general or liberal education. Thus, the welding of professional training and liberal education offers an excellent opportunity for developing our objectives for the intern, while at the same time solving the problems which arise from curricular inflation.

In his address "Liberal Education in Professional Curricula," recently given before the Association of Land Grant College and Universities, Dr. Virgil Hanscher, President of the State University of Iowa, showed (2) the potentialities of this type of education, and a way of achieving it. He defined the educated man as follows:

> We expect to find in the liberally educated man (or woman) . . . the ability to ascertain facts and to act upon them; to have the imagination and insights necessary to see the direction in which society is moving. We expect him to be able to make wise choices, both for the guidance of his personal life and for the collective decisions of the society of which he is a part. . . We expect him to know that this knowledge, combined with vision and creative power, can harness the forces of nature and work for the establishment of the "good" society. These are the elements of a liberal education which our state universities and land-grant colleges seek to instill in their graduates.

Dr. Hanscher points out clearly how technical fields may be used as the basis for a liberal education. According to his definition, liberal education imparts knowledge and develops the qualities we seek for the dietetic intern; namely, judgment, vision, spirit of service, the ability to get along with people, and the urge for continued study and professional growth.

Present trends of education are placing more emphasis on basic courses. The "tricks-of-the-trade" must be left to students to acquire elsewhere. The challenge for implementing this type of education rests largely on the teachers, Dr. Hanscher says:

> What we need . . . in our institutions of technology are teachers of professional and specialized subjects who see their subject matter in relation to the whole field of modern learning and modern civilization. . . We need teachers who see their subject matter not only as a means for developing techniques and skills, vitally important as these are, but also as the means for opening vistas which will challenge and inspire the students' imagination.

Those "whose imaginations have been stirred" and whose mental alertness and ability to think have been developed supposedly will be able to apply their information and, in addition, to create new and better ways of doing things. Dr. Agnes Fay Morgan has said (3):

> The study of foods and nutrition . . . must contain much more chemistry, biochemistry, and physiology than cooking, table setting, and calculation of diets, if nutritionists, dietitians, food analysts, and teachers are to serve the best purposes for which society pays them. Indeed, the cooking, table setting, and routine calculations are, in my opinion, wholly unnecessary except as they may offer illustration of principles or even comic relief. Students can be interested in both scientific and social concepts through the vital avenue of human nurture, often spelled nutrition.

I would agree with Dr. Morgan that food and nutrition are ideal pegs on which to hang a liberal education. As Dr. Sherman said (4), nutrition is a subject which appeals to the "spirit of service" and the "spirit of wonder." It has many aspects—scientific, esthetic, historic, economic, legal, medical, and humanitarian.

For improving our educational practices, Dr. Hanscher recommends procedures with which you are very familiar:

> We need to review our curricula often. We need to view them with a practical eye and to re-evaluate and eliminate and consolidate until we have only the fundamentals remaining. What we teach should be basic. It must lead the student out of those things which he can learn for himself, and it should be taught with that imagination and vision, that liberality of mind and spirit, necessary to assure that what the student learns will be learned in relation to the whole complex of modern knowledge and modern civilization.
>
> If this can be done, thousands of young men and women who otherwise might become merely narrow technicians will become not only able and effective citizens, but even their professional competence will be heightened because their eyes have been opened and their horizons widened to things beyond their childhood gaze.

Our teachers everywhere are evaluating curricula and courses. They are seeking to integrate and to consolidate. The formulation of generalizations or principles to be taught in the various courses is a first step in that direction. At the Iowa State College, teachers of core courses (those which all students take either because of their relation to general education or to homemaking) have been asked to prepare such statements for their courses. For example, the teachers of two of our food preparation courses last year cooperated in the formulation of statements of the principles they considered essential. The procedure was identical with that followed by internship directors in the compilation of generalizations for the dietetic internship. These have been given to the chemistry teachers, the household equipment teachers, and the home management teachers among others. By this procedure we expect to eliminate unnecessary duplication, and also to enable teachers to coordinate their efforts. The critical formulation of generalization, either for teaching or learning, is a concrete basis for thinking.

We are especially hopeful that through the medium of the generalizations, the teaching of chemistry will become more meaningful for our students. In this chemical age there is certainly no question about the importance of the study of chemistry. Our difficulty must rest largely in the interpretation of the meaning of the subject to the students. The chemistry teachers have welcomed the generalizations as an aid to them in their interpretations. This excerpt from a letter of one of our young students who decided to leave college after two years to be married offers a refreshing note regarding the chemistry question and its usefulness in everyday life:

> I remember just detesting chemistry, because I couldn't see much use for it. Unfortunately, I came out of it not knowing anything, but believe it or not, a lot of those things would come in useful in your shopping, and knowing if you should have your child's stomach pumped after he's eaten something he shouldn't.

The college education of the dietetic intern is constantly being improved through curriculum study, research in subject matter and educational methods, visual aids, testing devices, and continuous evaluation.

The primary purpose of a college or a university is to disseminate, interpret, and discover knowledge. (During certain seasons of the year, the acquisition of knowledge may not seem of paramount interest to the student, but the fact remains that the primary purpose of the college is to help the student acquire and use knowledge.) Since, in point of time, the college has four-fifths of the education of the dietetic intern, it should accept a heavy responsibility in providing the basic information. Nevertheless, much remains for the internship to do in preparing students for their working life.

The internship vitalizes the education we have tried to give and brings it to the point of crystallization. When visiting with dietetic interns on their first trip back to the campus, I am often gratified and a bit surprised to hear them toss off the medical and biochemical terms which in the college days were only definitions. Now these terms have true meaning for them.

There is one objective which gives me special concern, namely, "professional growth." Wilder, in his talk to the graduating interns at St. Marys Hospital (5), said the "essence of professionalism" is continued study. After leaving our classes and seminars, how many of our young dietitians do continue their study of original sources of information, such as the research articles in the JOURNAL OF THE AMERICAN DIETETIC ASSOCIATION or the *Journal of Nutrition?* Do they fall into the easy habit of relying on the "leaflet" information? We owe it to the dietetic intern to help her develop a plan, formal or informal, for future study and to stimulate her interest in doing so. When a person is once out of the habit of systematic study of the literature, it is difficult to resume it. Our education should whet not dull the appetite for continued learning.

One educational philosopher has said that the true value of education is to increase "curiosity and discontent." He said that the person who does not lose his curiosity and discontent is almost bound to be successful. The person who does is almost bound to remain on the level he had reached when he lost them.

For professional growth, our dietetic intern must also develop research-mindedness, so well described by Charles Kettering:

> Research is a high-hat word that scares a lot of people. It needn't. It is rather simple. Essentially, it is nothing but a state of mind—a friendly, welcoming attitude toward change. Going out to look for a change instead of waiting for it to come. Research, for practical men, is an effort to do things better and not to be caught asleep at the switch. The research state of mind can apply to anything: personal affairs or any kind of business, big or little. It is the problem-solving mind as contrasted with the let-well-enough-alone mind. It is the composer mind instead of the fiddler mind. It is the "tomorrow" mind instead of the "yesterday" mind.

College laboratories offer some opportunity for the development of the research method for solving problems, but the internship must be vastly richer with such opportunities. I can imagine that in a large organization where efficiency and expediency are of the essence, the development of this characteristic might present some really difficult problems. But I am convinced that the dietetic internship which emphasizes the *whys* more than the *hows* will produce the leaders of tomorrow.

The development of skill is another objective which merits careful consideration in our training program. "Skills" are something of an orphan in today's education program. No one seems to accept the responsibility of helping students to develop skills. In fact, colleges are reducing laboratory time, or eliminating it, to make room for additional subjects. Survey courses are popular. Home projects have been abandoned in many places because they are difficult to administer and many students were suspected of "dry-labbing" their reports. How much opportunity does the internship offer for the development of basic skills, particularly in food preparation and service? Is it assumed that these have been acquired?

With the public, the status of the dietitian rests heavily on her skill in planning and serving meals and in preparing foods. In fact, our profession loses prestige in the eyes of the public every time a qualified dietitian permits food of poor quality to be served. In the National Nutrition Conference for

Defense in May, 1941, Paul V. McNutt said (6), "Food often loses some of its gastronomic gusto when it is distilled through the coils of an expert." And Jonathan Daniels, author of the book, *A Southerner Discovers the South*, stated (7) that the food at a certain place was "as uninteresting as food always is when dietitians are in charge." These are attitudes which are all too common with the public. People are inclined to "chortle" when they can cite a so-called expert in food or nutrition who cannot "cook." No one would smile about a surgeon who could not operate. Perhaps there is a difference between skill in food preparation and possession of high standards in food service, but I am old-fashioned enough to believe that they are closely related. In order "to protect the status of the profession," dietitians should have the basic knowledge of their profession and skill in using it. Obviously, I am only raising the question of how to produce skills.

Our sights for the dietetic intern are admittedly high. Experience has shown that they are not unrealistic. At each convention of The American Dietetic Association we have a panorama of the results of our training program, with almost countless examples of the success we have enjoyed.

Within the last twenty years it has been my opportunity to see many students benefit from the joint program. The results have almost always been satisfactory. I should like to give one example that has recently come to my attention. This is a real life story, and to avoid identification we shall call the student, Gwendolyn, because I do not think I have had a student with that name recently.

A few years ago Gwendolyn entered Iowa State College, a transfer student from another institution where she had failed in the subject she had chosen as a major. In a brief experience in a hospital kitchen one summer, she enjoyed assisting in the preparation of special diets. This suggested the major in dietetics. Gwendolyn, the daughter of a farm family with parents of meager education, was then a rather large and unattractive girl.

Her record in college was on the whole unimpressive. Some of her teachers thought she lacked initiative, was slow to respond, that she seldom displayed interest and enthusiasm, and that she was stolid and definitely not the leader type. Her general rating, independently made by several teachers, was a "low average."

Under these circumstances, it was difficult to decide whether the girl should be recommended for an internship, and interestingly enough she herself questioned her qualifications for it. About the only noteworthy thing she did during her senior year, as I recall it, was to reduce. It was with some hesitation that we finally recommended her for an internship.

Imagine my deep satisfaction and even surprise to have the following report from her internship director on the completion of her work:

> Gwendolyn is a young woman who looks wholesome and healthy and who has the energy and physical stamina necessary to do a good professional job. A superior rate of mental comprehension enables her to grasp details and procedures rapidly and accurately. She is extremely quick in understanding and analyzing problems of administration. . . She has the qualities of a good administrator; adjusts easily; has a mature attitude and a logical approach to problems; is conscientious and prompt in the performance of all duties; and remains calm and imperturable in every emergency. Because of this personality trait, she sometimes gives the impression to others of lack of interest and enthusiasm which is completely contradictory to the excellent quality of her work. Her pleasant and ready sense of humor promotes good working relationship with others in either a supervisory or a supervised capacity. She has been one of the more outstanding interns in her group.

The college lays the foundation but the internship has a unique opportunity to discover and develop the abilities of the individual, to nurture them, and bring them to fruition.

Considering our goals for the dietetic intern, we are fortunate to have five years and two strong cooperating educational agencies committed to the accomplishment of the task. In evolving the dietetic internship, the dietetic profession has been farsighted and progressive. Frequently I hear leaders in other areas express the need for a fifth year, but the problems in establishing it now appear almost insurmountable. We are fortunate that our leaders in the twenties did see the need and the way. The effect of the dietetic internship in strengthening the profession has been immeasurable. Speaking from the college standpoint, I may say that I firmly believe that the curricula in home economics and the courses in food and nutrition everywhere are stronger because of the academic requirements of the internship.

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Scholarships and Loans Available to Dietetic Interns and Members of The American Dietetic Association Wishing to Pursue Graduate Study

The following compilation of scholarships and loans has been prepared from reports from state dietetic associations, dietetic internship directors, and other sources. The Headquarters Office of the Association would be pleased to learn of other financial aids which may not have been reported previously.

STATE	FORM	AMOUNT	AVAILABLE TO	SPONSORING AGENCY	WRITE TO:
Entire U. S.	Mary Swartz Rose Fellowship	$1000	Graduate students (see JOURNAL, November 1954, page 1137 for qualifications)	The American Dietetic Assn.—Nutrition Foundation, Inc.	Ruth M. Yakel, Exec. Sec. The American Dietetic Assn. 620 N. Michigan Ave. Chicago 11, Ill.
Entire U. S.	Loans	Up to $1000	Graduate students and some dietetic interns	The American Dietetic Assn.	Same
Entire U. S.	M. Faith McAuley Loan Fund	Up to $500	Graduate students in institution management	Illinois Dietetic Assn. through The American Dietetic Assn.	Same
Entire U. S.	Scholarship	$200	Dietetic intern in Catholic hospital	DuBois Foundation through Catholic Hospital Assn.	Catholic Hospital Assn. 1438 S. Grand Blvd. St. Louis 4, Mo.
Arizona	Scholarship	$125	University of Arizona food and nutrition major, for senior year	Arizona Dietetic Assn.	Ethel M. Thompson School of Home Economics University of Arizona Tucson, Arizona
California	Scholarship	$200	Senior in California college, for internship in any state, *or* any college senior for internship in California	California Dietetic Assn.	Grace Bodenhamer Richmond Hospital 23rd and Gaynor Richmond, California
Colorado	Scholarship	$150	Graduate of Colorado college, for internship in any state	Colorado Dietetic Assn.	Doris T. Odle Dept. of Medicine University of Colorado Denver, Colorado
Connecticut	Scholarship	$50 minimum	Graduates of any college who are legal residents of Connecticut, for internship in any state	Connecticut Dietetic Assn.	Evelyn F. Carlson Aetna Life Insurance Co. 151 Farmington Ave. Hartford 5, Conn.
Georgia	2 scholarships	$150 each	Seniors in Georgia colleges, for internships in any state	Georgia Dietetic Assn.	Catherine Newton University of Georgia Athens, Ga.
	Scholarship	$200	Seniors in Georgia college, for internship in any state	DuBois Foundation through Georgia Dietetic Assn.	Same
Illinois	Scholarship	$240	Graduate of Illinois college, for internship in any state	Illinois Dietetic Assn.	Eleanora Sense 1256 Early Ave. Chicago 40, Ill.
	Scholarship	$120	Dietetic intern at Cook County Hospital	Graduate staff and student organization of hospital	Millie E. Kalsem Cook County School of Nursing 1900 W. Polk St. Chicago 12, Ill.
Iowa	3 scholarships—1953-54 (number to be determined annually)	$50	Home Economics seniors or graduate students of Iowa colleges, for internships in Iowa or graduate study in Iowa	Iowa Dietetic Assn.	Dr. Margaret Osborn Dept. of Home Economics State University of Iowa Iowa City, Iowa
	Scholarship	$200	Dietetic interns in Iowa internship	DuBois Foundation through Iowa Dietetic Assn.	Same
Kansas	Loan	Up to $200 (2% interest)	Dietetic intern at University of Kansas Medical Center	University of Kansas Medical Center	Ruth Gordon University of Kansas Medical Center Kansas City, Kansas
	Scholarship	$200	Same	Same	Same
Louisiana	Scholarship	$100	Senior in Louisiana college, for internship in any state	Louisiana Dietetic Assn.	Dorothy S. Moschette Box 8295 University Station Baton Rouge, Louisiana

(Continued on page 158)

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Phosphorus	.33 gm.	.46 gm.
Vitamin A	940 I.U.	2380 I.U.
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STATE	FORM	AMOUNT	AVAILABLE TO	SPONSORING AGENCY	WRITE TO:
Maine	Scholarship	$200	Senior in Maine college for internship in any state	DuBois Foundation through Maine Dietetic Assn.	Mary Jo Hitchcock 11 Fernald Road Orono, Maine
Massachusetts	Frances Stern Loan Fund	Tuition assistance; no interest	Frances Stern Food Clinic interns participating in joint internship-graduate program	Frances Stern Food Clinic, The Boston Dispensary	Clare Forbes Frances Stern Food Clinic The Boston Dispensary 25 Bennet St. Boston, Mass.
	H. P. Hood Foundation Scholarship	Partial or full tuition at Tufts College	Frances Stern Food Clinic intern; available only to New England candidates	Tufts College	Graduate School Tufts College Boston, Massachusetts
	Scholarship	Tuition	Outstanding Frances Stern Food Clinic intern	Tufts College	Same
Michigan	Scholarship	$120	Senior in Michigan college, for internship in any state	Michigan Dietetic Assn.	M. Isabel Foster University Hospital Ann Arbor, Michigan
	Scholarship	Not stipulated	Intern at Harper Hospital	Harper Hospital	Mary M. Harrington Dept. of Dietetics Harper Hospital Detroit, Michigan
	Isola Denman Robinson Scholarship	$500	Intern at University Hospital	University Hospital	M. Isabel Foster University Hospital Ann Arbor, Michigan
Minnesota	Scholarship	$100	Interns in approved internship	Minnesota Dietetic Assn.	Mrs. Margaret Kienzle Glen Lake Sanitarium Oak Terrace, Minn.
New Mexico	Scholarship	$200	Senior in New Mexico college, for internship in any state	DuBois Foundation through New Mexico Dietetic Assn.	Isabel H. Hamilton VA Hospital Albuquerque, N. Mex.
New York	Scholarship	$200	Senior in New York college, for internship in any state	New York State Dietetic Assn.	Dorothy DeHart 2922 Richmond Terrace Staten Island, N. Y.
	Scholarship	$200	Intern in New York internship	DuBois Foundation through N.Y. State Dietetic Assn.	Same
North Carolina	Scholarship	$100	Senior in North Carolina college, for internship in any state	North Carolina Dietetic Assn.	Eleanor R. Bowdoin State Board of Health Raleigh, N. C.
	Scholarship	$200	Same	DuBois Foundation through North Carolina Dietetic Assn.	Same
Ohio	Scholarships (2 or 3 may be awarded)	$200 each	Senior in Ohio college, for internship in any state	Ohio Dietetic Assn.	Virginia Harger Campbell Hall Ohio State University Columbus 10, Ohio
	Fellowships	$1500	Dietetic residents; only for master's degree work for persons who have completed dietetic internship and 2 or more years' hospital experience	Ohio State University	Martha N. Lewis Ohio State University Hospital Columbus 10, Ohio
	Scholarships	Varies, depending on length of employment with University Hospitals	Members of University Hospitals' staff who have been employed 6 months up to 3 years	University Hospitals, Cleveland	Helen Mallory Dept. of Dietetics University Hospitals of Cleveland Cleveland, Ohio
	Sally Keller Welch Memorial Scholarship	$50	Dietetic intern in Cincinnati hospital	DuBois Foundation through Cincinnati Dietetic Assn.	Eleanor Maclay Professor of Home Economics University of Cincinnati Cincinnati, Ohio
Oklahoma	Scholarship	$100	Senior in Oklahoma college, for internship in any state	Oklahoma Dietetic Assn.	Dr. Helen Burton Home Economics Research University of Oklahoma Norman, Oklahoma
Oregon	Scholarship	$100	Graduate of Oregon college, for internship in any state	Oregon Dietetic Assn.	Dorothy B. Steen Dept. of Dietetics Emanuel Hospital Portland, Oregon

(Concluded on page 160)

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Wheat and Corn Enrichment for Egypt

Experimental enrichment of corn and wheat in Egypt to combat pellagra and anemia has been recommended by consultants of the World Health Organization to the Egyptian Ministry of Health.

These experts spent two months visiting towns, villages, schools, hospitals, clinics, and maternal and child health centers in the Cairo region, Luxor, Aswan, and coastal areas around Alexandria. The survey indicated that anemia was found in areas where wheat is eaten as well as in corn-consuming districts. Children and pregnant women were the groups most affected. Because of the prevalence of parasitic infections resulting in blood deficiency, anemia was shown to be the cause of more ill health than pellagra which was most common in areas where maize is the chief cereal eaten. It was not found at all in cities and towns where government-subsidized wheat is the chief food. The rate was low in areas where fish, rice, barley, millet, and dates are eaten.

The report indicates that substantial improvements could be obtained by: (a) enrichment of corn at the village mill with iron and niacin, and (b) government subsidized exchange of wheat enriched with iron for corn produced by villagers. It is suggested that these two approaches be tried in selected areas for eighteen months to determine which is most effective and economical, so that it could be applied to the rest of the country.

Establishment of a national nutritional committee to study the results and to give continuing support to dietary improvement was also recommended.

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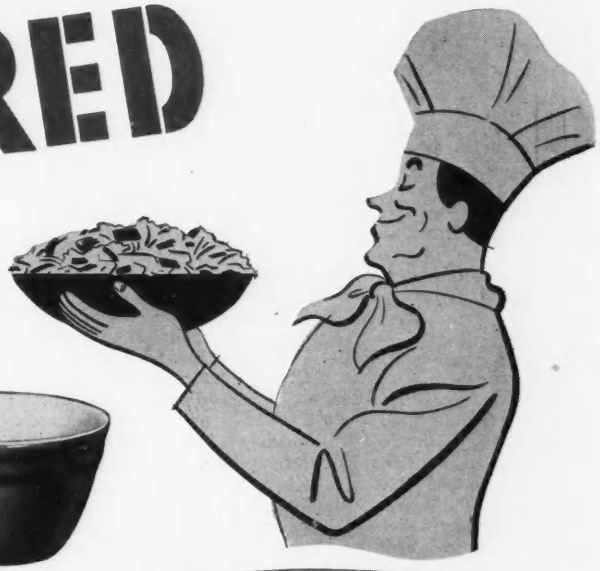

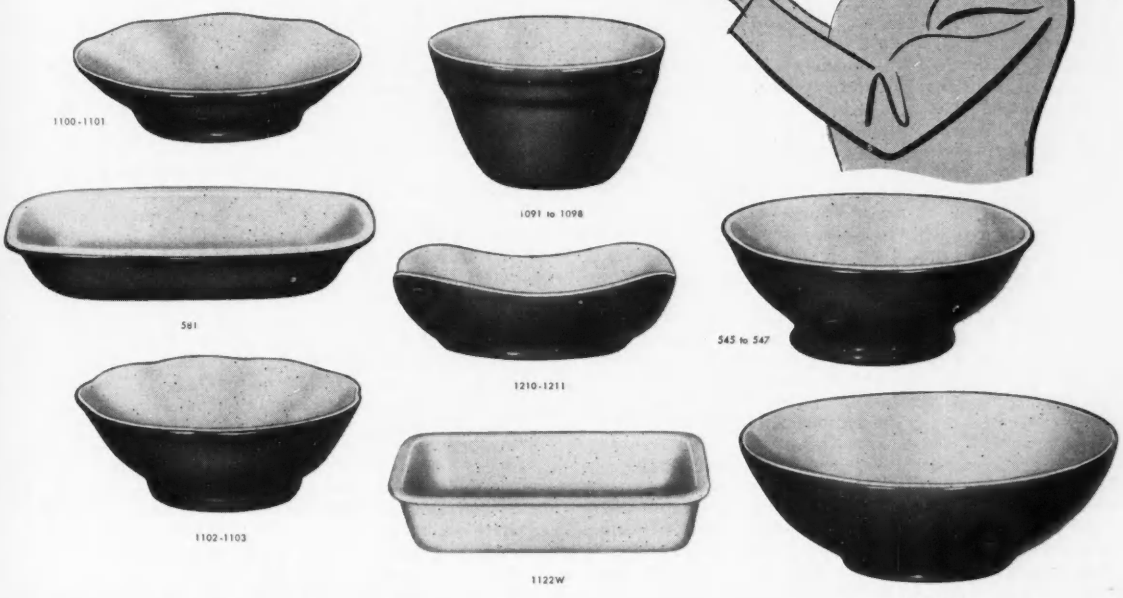

The preparation, serving, and storage of salads is an assured success when Hall China is used. Made of heavy china by an exclusive process . . . all Hall salad dishes are crazeproof, absorption-proof, and stainproof. Ordinary cleaning makes them as fresh and bright as new.

Write for Bulletin SM-1 which lists and illustrates Hall casseroles, baking dishes, coffee and teapots, creamers, jugs, ash trays, salads, and many other items available in 27 beautiful underglaze colors.

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Book Reviews

Roberts' Nutrition Work with Children. By Ethel Austin Martin. Chicago: The University of Chicago Press, 1954. Cloth. Pp. 527. Price $7.50.

Nutritionists have been waiting the appearance of this book with high hopes ever since word "got around" that Ethel Austin Martin was to build on the sound foundation laid by Lydia Roberts. But the new version is even better than we had expected. It retains the admirable features that have made *Nutrition Work with Children* indispensable to the teacher of nutrition, the advanced student, and the practicing nutritionist. At the same time, it deals most adequately with the developments of the past twenty years in our knowledge of child nutrition and in our nutrition programs. All this has been accomplished without increasing the length of the book. Mrs. Martin has done a masterly job of condensing the original material, of selecting significant recent findings, and of presenting new material concisely but clearly. In the case of both old and new, the comprehensive list of references at the end of each chapter serves as a guide to the reader who wishes to delve into sources. The result of what might be called end-to-end collaboration is a book that is as readable as it is informative and well balanced.

Readers who are making the acquaintance of the book for the first time are likely to be surprised and pleased that it covers a much wider scope than the title indicates. To be sure, nutrition work with children is covered—and covered thoroughly—in the last half. Here, as nowhere else, there is an account of the various American and international agencies concerned with nutrition, of the many types of state and local nutrition programs that affect children directly or indirectly, and of nutrition education in the school and community. But the title gives no hint of the content of the first seven chapters, which set forth the scientific foundation for nutrition work with children. These chapters summarize the most significant research findings on nutrition as related to physical growth and development of children, the methods for appraisal of nutritional status, the causes and effects of malnutrition, and the nutrients required for attaining and maintaining optimal nutritional status at all stages of growth.

In the short time that has elapsed since publication, favorable comments on the book have come to the reviewer from many sources. The verdict from one group of students in an advanced class in child nutrition was: "Why, this is actually good reading!" Doubtless the students were reacting not only to the writing but to the excellent format, the telling charts, and the effective new photographs. Their enthusiasm is shared by more mature readers. A highly useful new tool has been put into the hands of those of us who are doing nutrition work with children or for children. —*Marjorie M. Heseltine, Chief, Nutrition Section, Division of Health Services, Children's Bureau, Department of Health, Education, and Welfare, Washington, D. C.*

A Devotion to Nutrition. By Frederick Hoelzel. New York: Vantage Press Inc., 1954. Cloth. Pp. 88. Price $2.50.

This is the nutritional life story of a man now sixty-four years of age who, since 1908 has, on eight different occasions, fasted for periods of from eight to forty-one consecutive days. The author's experiments have had a happier outcome than for William Stark (1741–1770) who died at the age of twenty-nine because of his self-studies on restricted diet. Hoelzel was physically weak as a youth, and in a desire to improve his physical ability, he followed mainly the ideas of Fletcher, Chittenden, and Hindhede and tried to live on a meatless diet or on a fruit and low-protein diet. He eventually found that the most permanent improvement in general health came from a liberal protein diet including meat. The author's first fasting experiment was made under observation at the University of Chicago in 1917, and from then on, studies on continuous fasts, fasting every other day, and fasting one out of three days were made on himself and on rats. Some of these experiments were in conjunction with Anton J. Carlson, and in all, Hoelzel has published fifty-two papers in leading scientific and medical journals.

The story in the book is one individual's experiences in self-investigation; his findings do not always conform to the orthodox viewpoint, but do merit careful consideration. The book is best suited to use of students of nutrition, dietetics, and medicine who should be in a position to evaluate the results as presented, and also be stimulated to further research in problems of appetite, hunger, and fasting.

The author, Frederick Hoelzel, was born in Bavaria and came to this country as a child. Without formal training in science, he is Assistant in Physiology at the University of Chicago.—*E. Neige Todhunter, Ph.D. Dean, School of Home Economics, University of Alabama, Tuscaloosa.*

What's Cooking? Quantity Cooking for All Occasions. By Jane Kirk. Westwood, N. J.: Fleming H. Revell Company, 1954. Cloth. Pp. 383. Price $3.95.

This quantity cook book, prepared by the editor of the "Woman's Place in the Church" Department for *Christian Herald*, was designed for use by church groups, women's clubs, P.T.A.'s, and for men and women who, on occasion, must assume the role of chef or meal planner for groups.

Here are numerous ideas for suppers, teas, luncheons, covered dish affairs, snacks, outdoor cookery, and foreign cookery. Also included are large quantity buying guides and a table of weights and measures. The discussions preceding each section are easy to read and assuring, with hints for organizing the work to be done.

The recipes are for varying quantities and are less technical than those found in some quantity cook books. They are simple yet present a wide variety of menu ideas and interesting names. Included in the "Covered Dish Affairs" are ham with orange curried rice, baked deviled eggs, and oven-easy chicken. Among the breads are tasty-tempting buttermilk muffins, hot cross buns, and southern spoon bread. Directions are given for brewing coffee in an open kettle as well as for making it in an urn, and there is a recipe for preparing ahead of time a cocoa paste which, with the addition of hot milk, is said to make a perfect cup of cocoa. There are many varieties of punch, and some unusual sounding recipes for sandwiches. Along with the regular pies are listed lime chiffon, polka dot, marshmallow pumpkin, and fudge topped pies.

This is a delightful book to read and could be a welcome addition to any menu planner's shelf.—*Mildred Bonnell, Assistant Director University Dining Halls, University of Washington, Seattle.*

RECENT BOOKS RECEIVED

Standard Values in Nutrition and Metabolism. *Being the second fascicle of a Handbook of Biological Data.* Edited by Errett C. Albritton, M.D. Philadelphia: W. B. Saunders Company, 1954. Fabricoid. Pp. 380. Price $6.50.

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Current Literature

Contributed by Mildred Bonnell and administrative dietetic interns, University of Washington, Seattle; Janette C. Carlsen and Ethel M. Miller, The Johns Hopkins Hospital, Baltimore; Marjorie Cheney, Dietetic Intern, Veterans Administration Center, Los Angeles; and the Journal staff

THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES

Vol. 228, November, 1954

* The incidence of perforation in benign peptic ulcer of the greater curvature of the stomach. M. Feldman.—p. 506.

Perforation in Benign Peptic Ulcer. Recent literature was surveyed and sixty-eight collected cases were examined to determine the incidence, frequency of perforation, site of perforation, and the organs and adjacent tissues involved in the benign peptic ulcer of the greater curvature of the stomach. It was reported that this condition represented 2 to 3 per cent of all such ulcers, occurred predominantly in the body of the stomach, and was larger than the ulcer occurring on the lesser curvature. Benign peptic ulcers of the greater curvature were not usually associated with peptic ulcers elsewhere in the gastroduodenal region. Of the sixty-eight cases reviewed, only 17 per cent revealed perforation. The gastrocolic omentum, transverse colon, and spleen were the organs most often involved.

THE AMERICAN JOURNAL OF MEDICINE

Vol. 17, November, 1954

* Effect of the oscillating bed and tilt table on calcium, phosphorus and nitrogen metabolism in paraplegia. D. M. Wyse and C. J. Pattee.—p. 645.
* Treatment of hypertensive disease with hydralazine. Comparison of its action with that of low sodium diet in hospitalized patients. A. J. Stunkard, G. H. Eurman, M. Wachspress, and A. R. Wertheim.—p. 712.

Effects of Oscillating Bed in Paraplegia. Paraplegia is followed by metabolic changes characterized by disuse, osteoporosis, hypercalciuria, and negative nitrogen balance. Disuse osteoporosis has been postulated to be due to failure of osteoblastic activity, resulting from lack of "stress and strains" on bone. The metabolic changes, notably in calcium metabolism, of parapelgia have been found to return to normal only upon ambulation, which is rarely possible before the fourth month after injury. An attempt was, therefore, made in five paraplegic patients to imitate ambulation while the patients were still immobilized by means of the oscillating bed and by the tilt table. Calcium balance studies and roentgenographs failed to demonstrate any significant effect in the patients either on the osteoporosis or hypercalciuria. Studies of nitrogen metabolism revealed that anabolism or equilibrium was attained in all patients, provided adequate nutrition was available following injury. One patient with a lesion of thirteen months' duration demonstrated a positive calcium balance despite concomitant hypercalciuria. No significant effects on nitrogen or phosphorus metabolism, basal metabolic rate, renal function tests, or urinary 17-ketosteroids were observed.

Treatment of Hypertension with Diet and Hydralazine. A controlled study of the effects of hydralazine in the hospital treatment of twenty-five patients with essential hypertension is reported. These results are compared with those obtained under the same conditions by treatment with low-sodium diets. Significant reduction in blood pressure was achieved in seventeen patients (68 per cent) over an average of thirteen weeks. There was regression of such changes as hypertensive retinopathy and cardiac failure in less than 35 per cent of these patients. Side reactions in most and intolerance in some patients require careful regulation of dosage and supportive measures. The duration of this study does not permit conclusions as to possible ill effects of prolonged administration of hydralazine. Comparison with treatment by low-sodium diet reveals hydralazine to be of somewhat lesser therapeutic potency, but greater ease of management compensates for this disadvantage.

AMERICAN JOURNAL OF PUBLIC HEALTH

Vol. 44, November, 1954

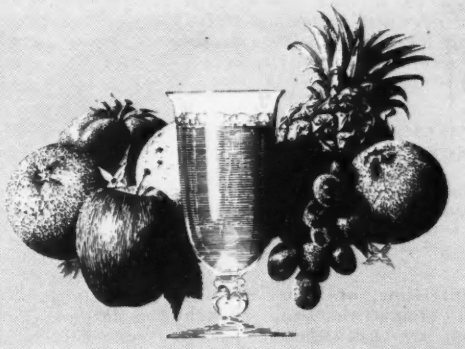
* Endemic goiter in Honduras. E. A. Borjas and N. S. Scrimshaw.—p. 1411.
* The health department's responsibility for providing nutrition services to institutions. R. E. Dwork.—p. 1428.
* The new Institute of Nutrition (INCAP). Editorial.—p. 1463.

Endemic Goiter in Honduras. A total of 12,292 school children and 352 adults in Honduras, comprising nearly 1 per cent of the population in all fifteen departments, have been examined for endemic goiter by palpation and inspection of the neck. The survey showed nearly one-fourth (22.6 per cent) to have pathologically enlarged thyroids. Slightly less than 15 per cent of the goiters were readily visible without careful inspection, and fewer than 1 per cent were nodular. Omitting the four departments in which endemic goiter was not found to be a problem, the remaining three-quarters of the population had an over-all incidence of 29.1 per cent. Endemic goiter is thus considered to be a serious public health menace in Honduras, and the iodization of all salt for human consumption is recommended. Although goitrogenic factors are believed to be important, none has been identified, except for the possible importance of a very widespread deficiency of vitamin A. A level of iodization of not less than 1 part iodine in 20,000 parts salt nor more than 1 part in 10,000 is recommended.

Nutrition Services of Health Departments. A representative of the Ohio Department of Health outlines the dietary consultation services which that department makes available to small Ohio institutions without qualified dietitians. This help includes checking design and equipment plans for kitchens, training of dietary personnel, patient education, and work with local health departments so that they may follow up the state consultant's ground work. It is the philosophy of the Ohio Department of Health that the public health implications of food service in institutions are great enough to warrant this help. Lessons in nutrition learned by hospitalized patients can speed their recovery at home. There is little doubt that good food service in an institution has far-reaching effects in community health. The department also feels a responsibility in helping hospital administrators, nurses, kitchen workers, and local health departments to recognize that dietetics is a professional field and not something to be passed around and divided up and assigned to whomever is not too busy. The Ohio program encourages local health departments to help jointly with training, demonstrations, and instruction of individuals or groups of patients.

Institute of Nutrition. The inauguration on September 11, 1954, in Guatemala City of a new building specially designed for research and training in public health nutrition represents the successful termination of the first five years of a unique and important international effort. The Institute of Nutrition of Central America and Panama (INCAP) is a cooperative project of the five Central American countries administered by the Pan American Sanitary Bureau, Regional Office of the World Health Organization, and assisted from its beginning by the W. K. Kellogg Foundation. Originally established in September 1949, the activities of INCAP quickly outgrew its initial facilities, and the present building has been under construction by the Guatemalan government for two years at a total cost of $180,000. Among the projects of international importance have been the publication of a food composition table for the region, the demonstration of the seriouness of endemic goiter in the area, and the development of a practical method for the iodization of crude salt. It is particu-

WHY SHOULD THE VITAMIN C CONTENT OF FRUIT AND VEGETABLE JUICES BE STANDARDIZED?



Because nutrition reports disclose that—

- **Vitamin C deficiencies exist throughout the country***
- **Scurvy has not disappeared from the United States***

Proof of deficiencies among adults and children. You should know these facts!* Diet surveys from Maine and Vermont, New York, Illinois, New Mexico, Oregon, West Virginia, and Texas show a definite pattern of inadequate vitamin C intake. These studies covered grade school and high school children, college men and women.

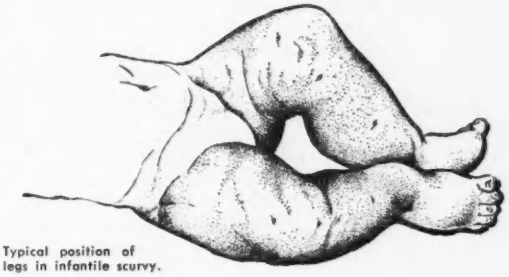
Spongy, swollen gums symptomatic of scurvy.

From these studies* of dietary habits and physical conditions there is considerable proof that many of the children and adults covered by survey have actual, physical symptoms of vitamin C deficiency.

Infantile scurvy. Scurvy* occurs, even today, among infants who are artificially fed. Fortunately the disease may be cured by the administration of vitamin C. How much more sensible it is to prevent it by supplying these bottle-fed infants with the daily allowance of 30 milligrams of vitamin C as recommended by the Food and Nutrition Board of the National Research Council for children under one year of age.

Symptoms of infantile scurvy are fretfulness and fear of being touched.

These bottle-fed infants, unless receiving a pediatric prescription containing vitamin C, are largely dependent on supplemental ascorbic acid which they receive from citrus or tomato juices. Unfortunately, however, these juices may not contain enough vitamin C to supply these babies with needed quantities of this essential element.



Typical position of legs in infantile scurvy.

What can be done? Because of the increasing evidence that American diets are deficient in vitamin C, leading nutrition experts believe that processed fruit and vegetable juices, on which the public is so reliant for its supply of this necessary vitamin, should contain the "Vital Ingredient."

The Vital Ingredient of any processed fruit or vegetable juice is a *dependable* and *adequate* supply of vitamin C. You can give your juice this ingredient by *standardizing its vitamin C content*. The processing is simple and the new low cost of ascorbic acid makes juice standardization more attractive than ever.

With ascorbic acid available *by the tons* at extremely modest cost fruit and vegetable juices can have a standardized vitamin C content for the better protection of the nation's health and well-being.

*Statements are based on documented reports. References on request.

Illustrations after photographs in The Vitamins in Medicine by Bicknell and Prescott, Third Edition, published by Grune & Stratton, Inc., New York.

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larly significant that, with the sole exception of the director, the extensive programs have been carried out entirely by Central Americans who have received and are receiving advanced training in various institutions in the U. S.

THE AMERICAN JOURNAL OF SURGERY

Vol. 88, November, 1954

* The treatment of malnutrition with particular reference to the surgical patient. W. R. Waddell, R. P. Geyer, H. C. Grillo, and F. J. Stare.—p. 698.

Malnutrition of the Surgical Patient. Malnutrition and outright starvation are still common clinical problems in general surgery. Whenever regular feeding is possible, the maximum should be obtained by encouraging the patient. "Blenderized" meals and tube feedings with vitamin and mineral supplements are the next best. Parenterally, dextrose and protein hydrolysates can be given in adequate amounts to maintain body equilibrium. This often is not enough, and there are sharp limitations on the protein and dextrose parenteral feedings: (a) only 4 calories per gram of each; (b) the osmotic effect of these molecules makes it impractical to raise their concentrations to higher levels because of irritation and thrombosis of veins; and (c) they are readily excreted in the urine, depending in large part on the concentration infused and the rate of infusion. The most promising approach to parenteral feeding is the development of fat emulsion suitable for intravenous administration. Its advantages are high caloric intake with no osmotic effect so that high concentrations can be used.

ARCHIVES OF INTERNAL MEDICINE

Vol. 94, November, 1954

* Nutritional hepatic injury. H. Popper and F. Schaffner.—p. 785.
* Survey of the 1953 hematology literature (continued). C. Wright, D. S. Mabry, R. D. Carr, and A. M. Perry.—p. 806.

Nutritional Hepatic Injury. Clinical, functional, and structural alteration of the liver may be due to disturbances of nutrition. The study has received impetus from animal experiments in which well defined nutritional injuries were produced at will. It appears that caloric under-nutrition and deficiencies of individual food constituents are less important than dietary imbalance or malnutrition. The main result of malnutrition is the fatty liver-cirrhosis syndrome, predominantly encountered in alcoholics in the temperate zone. The modification of the syndrome by such factors as intercurrent infection or toxins account for the variety of clinical manifestations and, quite likely, for the transition of the simple fatty liver into hepatic insufficiency and cirrhosis.

BRITISH MEDICAL JOURNAL

No. 4895, October 30, 1954

* The liver in ulcerative colitis. R. G. F. Parker and E. J. C. Kendall.—p. 1030.

No. 4897, November 13, 1954

* The fallacy of the furred tongue. B. Gans.—p. 1146.

Liver in Ulcerative Colitis. The liver lesions in seventy-three cases of ulcerative colitis between the years 1914 and 1953 were studied. Inflammatory cell infiltration was minimal and, except in one case with biliary obstruction, cirrhosis was not present. It is concluded that there is little if any increased liability to the development of cirrhosis in patients with ulcerative colitis as compared with the population as a whole.

Fallacy of the Furred Tongue. A deep-rooted belief exists in both lay and medical minds that a furred tongue in a child not suffering from acute illness is of significance. In this study of 750 children, no association could be demonstrated between the state of the tongue and a variety of abnormalities ranging from tongue-tie to tics, and from murmurs to Mongolism.

CANADIAN MEDICAL ASSOCIATION JOURNAL

Vol. 71, November, 1954

* The effect of estrogens on sodium metabolism in hypertensive men. A. G. Ramsay, J. A. Lewis, and N. S. Burt.—p. 472.

Estrogens in Hypertension. Serious consideration is being given to the use of estrogens in the treatment of certain cardiovascular disorders. There is a possibility that female sex hormones, when given to hypertensive men over long periods may produce a derangement of sodium metabolism. In this study, five patients failed to show any evidence of sodium retention when given estrogen; five others showed a decrease in the urinary excretion of sodium; two cases had no significant change; and in three cases, urinary excretion of sodium decreased from abnormally high values to values within the normal range. Thus it is concluded that prolonged therapy with conjugated estrogenic preparation in hypertensive men, in the dosage used (0.625 or 1.25 mg.) does not result in sodium retention.

GASTROENTEROLOGY

Vol. 27, October, 1954

* Progressively increasing incidence of gastroduodenal hemorrhages during the last six years—having reached the highest point in autumn 1953. E. Danopoulos and S. D. Moulopoulos.—p. 451.
* Experimental effect of two recent anticholinergic drugs on insulin-induced gastric secretion in duodenal ulcer. B. B. Weisiger, J. O. Burke, and K. Plummer.—p. 469.

Anticholinergic Drugs in Peptic Ulcer. In this experiment, ten patients with duodenal ulcer were treated with two anticholinergic drugs, Darstine and Antrenyl. Darstine (5-methyl-4-phenyl-1-1 piperidyl-3 hexanol methobromide) was administered to five and Antrenyl (diethyl [2-hydroxyethyl] methylammonium bromide alpha-phenyl-cyclohexaneglycate) to the other five. The purpose was to test the drugs' ability to block insulin-induced gastric secretion. Darstine produced a statistically significant decrease in muco-protein and pepsin output during hypoglycemia, while Antrenyl caused a reduction in pepsin output and volume response to insulin stimulation. No significant fall in output of free hydrochloric acid with the administration of either drug prior to the induction of hypoglycemia was observed. A possible physiologic basis for the phenomenon was discussed.

Gastroduodenal Hemorrhage. A study done at the University of Athens indicates a definite increase in the incidence of upper digestive tract hemorrhages since 1947. The highest point was reached in the autumn of 1953. The statistics quoted include bleeding ulcers and hemorrhages for which no history of ulcer or X-ray examination was available.

JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY

Vol. 2, November 10, 1954

* Cereals in nutrition. Nutritive value of rice germ. M. C. Kik.—p. 1179.

Vol. 2, November 24, 1954

* Proteins in flour. Review of physical characteristics of gluten and reactive groups involved in change in oxidation. Garvan Medal Address. B. Sullivan.—p. 1231.

Nutritive Value of Rice Germ. The high protein content of wheat and corn germs led to the investigation of the protein in rice germ. Results indicate that rice germ protein could be a highly useful human and animal food. Vitamin content compares with that of wheat and corn germs, with thiamine content of the rice germ somewhat higher. An increase of 31.2 per cent in growth and of 47.1 per cent in protein efficiency was found in animals fed a ration containing 5.7 per cent protein derived from rice germ alone, which indicates that rice germ has better nutritive values than milled rice at that level of protein intake. Animals fed a ration at a 9 per cent rice germ protein level made an average gain of 114 gm. Protein efficiency ratio was 1.90, which is less than at the 5.7 per cent level. This can be explained by the greater protein intake per gram gain of body weight. It was also found that the content of essential amino acids in rice germs is considerably higher than in milled rice.

Physical Characteristics of Gluten. In this Garvan Medal Address, the present state of our knowledge of the proteins of flour is reviewed. The reactive groups of gluten involved in the oxidation and reduction of flour are, so far as is known, the sulphur-containing amino acids, cysteine, cystine, and methionine. Maturing agents exert their beneficial effect by action on free and combined mercapto groups of the protein, but the mechanism of their action is still unsolved.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

Vol. 156, November 13, 1954

* Sodium-restricted diets.—p. 1081.
* Peru: nutrition studies.—p. 1102.

Vol. 156, November 20, 1954

* New standards for lead content of food. Foreign Letters.—p. 1188.

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• Vitamin B_{12} labeled with radioactive cobalt. Foreign Letters.—p. 1189.

Vol. 156, December 4, 1954

• Cola drinks. Queries and Minor Notes.—p. 1376.

Sodium-Restricted Diets. The popularity of sodium-restricted diets has increased greatly in recent years because of increased knowledge about the sodium content of foods, improved methods of determination of sodium in blood, urine, and foods, and the therapeutic usefulness of sodium restriction in several diseases. The article, which is adapted from the new National Research Council publication, *Sodium-Restricted Diets*, points out that in a study of diet manuals used in hospitals throughout the country, the low-sodium diets varied in their estimated sodium content from 160 to 1000 mg. per day or more. Thus the physician who prescribes a low-sodium diet without indicating the quantity of sodium required daily might find the program quite effective in a hospital using the lower level, but without benefit to his patients in a hospital using the higher level. Harmful results may follow the restriction of sodium intake. Therefore, although most normal persons can withstand severe sodium restriction without ill-effects, this treatment should not be undertaken without a physician's recommendation and frequent evaluation. Sodium metabolism in the normal person depends on the integrity and functional capacity of the kidney and certain of the endocrine glands. Diseases involving these organs may influence profoundly and adversely the normal sequence of events. Even with the regulating mechanisms operating normally, sodium loss will result from prolonged vomiting, diarrhea, exposure to heat, profuse sweating, or the exudation of fluid from burned or other denuded areas. These abnormal losses must be considered when sodium restriction is planned.

Nutrition Studies in Peru. Studies have shown that although Peru is now able to supply to its inhabitants a calorically adequate diet, this goal has not been achieved because sufficient foods are still not being produced and because many persons are still too poor to buy such a diet. There is a deficit of plasma proteins in certain groups of the population, especially in those of the poor class. This problem could be solved by increasing fish consumption. The use of such cereals as rice and *quinua* should be encouraged as an added source of protein. The iron content of Peruvian foods is similar to that of foods in other countries. The frequency of anemia in Peru appears to be due to the protein deficit and not to a lack of iron. In almost all the human groups studied, including the well-to-do, a notable deficit of ascorbic acid was observed. The vitamin B intake is also inadequate in all classes of society.

New British Standards for Lead Content of Food. New limits for the lead content of foods have been recommended in England. The daily intake of lead by a normal person is put at about 0.4 mg. A heavy drinker or a lead worker would have a much higher intake. Since between 1 and 2 mg. lead can be ingested daily without toxic effect and consumption of 2 lb. food containing 1 p.p.m. would contribute 0.9 mg., it is clear that the limits of contamination of foods and beverages must be kept very low if the safety limit is not to be exceeded. Some of the recommended limits are 0.5 p.p.m. for edible fats and oils and refined white sugar; 1 p.p.m. for ice cream and popsicles; 5 p.p.m. for canned meats and fish; and 10 p.p.m. for tea, dried herbs, and spices.

Vitamin B_{12} Labeled with Radioactive Cobalt. Because of the comparatively long half life of cobalt-60 and the possibility of radiation hazards to man after ingesting it, the use of vitamin B_{12} labeled with this isotope is somewhat restricted. It has been found, however, that the isotope cobalt-58 is almost ideal as an alternative, as it has a hard gamma radiation and a half life of only seventy-two days, compared with five years for cobalt-60. It, therefore, presents little radiation hazard after ingestion. Cobalt-58 has been used in parallel with cobalt-60-labeled vitamin B_{12} in fecal excretion studies, and the results with the two materials are identical within the limits of experimental error. It is expected that as supplies of cobalt-58 become more freely available, the vitamin labeled with this isotope will replace that labeled with cobalt-60 in clinical investigation.

Cola Drinks. Cola drinks are basically composed of a solution of sugar in carbonated water. The flavoring is primarily an extract of the kola nut, whose physiologic and pharmacologic importance depends chiefly on its caffeine and theobromine content. It is believed that, of the two, caffeine is the more important ingredient. Caffeine content of leading cola drinks ranges from 0.06 to 0.6 gr. in each 6 fluid oz. Typical representatives are Coca-Cola, averaging 0.5 gr. and Pepsi-Cola, with 0.6 gr. Taken in the form of a cola drink, caffeine would have an immediately perceptible action only when taken in relatively large quantities. Some diuretic action is also possible due to the xanthine content, but these active ingredients are all present in doses markedly below those used for any constructive therapeutic end.

JOURNAL OF AVIATION MEDICINE

Vol. 25, October, 1954

• In-flight feeding during sustained flight of single-place jet aircraft. A. W. Van Sickle and R. J. Hogan.—p. 523.

In-Flight Feeding During Sustained Flight. A description of the problems encountered in feeding on a non-stop 10½-hr. flight of single-place jet aircraft mentions food consisting of three items: two 7½-oz. cans of chocolate milk; two 8¾-oz. cans of "King's Fare," a liquid, low-calorie homogenized beef and vegetable mixture with meat flavored base; and two boxes of Food Packet, Individual, Fighter Pilot (FP-1) which consisted of small coated candies, chocolate bars, and chewing gum averaging about 500 calories per box. The lack of significant evidence of fatigue in the pilots after the reported flight was due to a number of factors. Among these were proper preflight preparation and feeding, the use of water and nutritional items during flight, the use of comfortable items of personal equipment and clothing. The food items and experimental food servicing equipment used on the flight, with the exception of the food storage provisions, were generally satisfactory. Adequate amounts of water and suitable foods for pilots on flights of this type are significant factors in reducing fatigue, maintaining high levels of performance, and improving flight safety. Emphasis cannot be too strongly placed on the need for the close coordination of the physiologist and nutritionist with the aircraft designer.

THE JOURNAL OF BIOLOGICAL CHEMISTRY

Vol. 210, October, 1954

• Antioxidant studies concerned with the metabolism of carotene and vitamin A. E. G. High, H. C. Smith, Jr., H. H. Taylor, and S. S. Wilson.—p. 681.

Independent antagonism of amino acid incorporation into protein. M. Rabinovitz, M. E. Olson, and D. M. Greenberg.—p. 837.

Antioxidants and Metabolism of Carotene and Vitamin A. Vitamin A-deficient albino rats were supplemented daily for twenty-one to twenty-five days with one of three antioxidants plus either a moderate amount of carotene or of vitamin A in cottonseed oil. Control rats received either the carotene or vitamin A alone in oil. Large amounts (10 mg. per day) of the antioxidants significantly decreased hepatic vitamin A deposition from carotene-fed rats, but did not affect the utilization of preformed vitamin A. This suggests that these substances affect carotene prior to its conversion to vitamin A. Over a period of four days, no significant differences were observed in the fecal excretion of carotene among groups, suggesting that the effects of these antioxidants are not concerned with the absorption of carotene in the alimentary tract. In all cases, the antioxidants markedly protected carotene against oxidative decomposition. The experiments support the view that the locus of action of the antioxidants as well as of vitamin E in large amounts is in the intestinal wall or at the site of the conversion of carotene to vitamin A and that their mode of action is concerned either directly or indirectly with a suppression of the oxidative processes involved in the enzymatic conversion of carotene to vitamin A.

JOURNAL OF CLINICAL INVESTIGATION

Vol. 33, November, 1954

• Observations on the sodium-retaining corticoid (aldosterone) in the urine of children and adults in relation to sodium balance and edema. J. A. Leutscher and B. B. Johnson.—p. 1441.

• Studies on copper metabolism. XIII. Hepatolenticular degeneration. G. C. Cartwright, R. E. Hodges, C. J. Gubler, J. P. Mahoney, K. Daum, M. M. Wintrobe, and W. B. Bean.—p. 1487.

• Thiamine and cocarboxylase concentration in

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heart, liver, and kidney of patients with heart failure. M. G. Wohl, M. Brody, C. R. Shuman, R. Turner, and J. Brody.—p. 1580.

Sodium-Retaining Corticoid. Forty-eight specimens of urine from normal adults and children and from hospitalized patients have been extracted with chloroform within forty min. after acidification to *p*H 1.0. The sodium-retaining activity of the extracted material was measured by bioassay. Significant activity was observed in extracts prepared from the urine of a number of edematous patients with lipemic nephrosis, cardiac failure, and hepatic cirrhosis. Urine extracts from normal men and women often had an opposite effect, tending to increase the excretion of sodium in the adrenalectomized rats, resembling the effect of hydrocortisone in the bioassay used. Increased sodium-retaining activity was found in the urine of some normal men and women when sodium intake was reduced to 11 mEq per day. The level of sodium retention appeared to be related to the daily output of sodium by the patient, rather than to a specific disease, to the state of hydration, or to flow of urine. The sodium-retaining activity of extracts of urine from several patients with lipemic nephrosis, cardiac failure, or hepatic cirrhosis was found in the same chromatographic fraction of each extract tested. Some normal men on low-sodium diets showed increased activity in the same fraction of the chromatograms. This fraction has been observed to contain a corticosteroid which is presumed to be aldosterone on the basis of its chromatographic and biologic properties.

Copper Metabolism. Various aspects of copper metabolism have been studied in seven patients with hepatolenticular degeneration. The following abnormalities have been demonstrated: (a) a decrease in the plasma total copper level; (b) an increase in the direct-reacting fractions of plasma copper; (c) a decrease in the indirect-reaction fraction of plasma copper; (d) an increase in the concentration of copper in the spinal fluid, all of which was direct-reacting; (e) a large increase in the concentration of copper in all of the tissues studied, except heart muscle, skeletal muscle, lung, and erythrocytes; (f) a state of positive copper balance; and (g) an increased excretion of urinary copper. As a tentative hypothesis to explain the observations, it is proposed that in such patients there is a congenital deficiency in the formation of ceruloplasmin. As a consequence, the absorption of copper is increased with accumulation in the tissues. Due to accumulation of copper in the brain, liver, and cornea, the characteristic pathologic lesions of the disease appear. The accumulation in the kidney causes a functional impairment in the reabsorption of certain amino acids and peptides, and and amino-aciduria and peptiuria result. With the accumulation of copper in the tissues, copper is chelated by amino acids and peptides and is excreted in the increased amounts in the urine.

Tissue Thiamine and Cocarboxylase in Heart Failure. Heart, liver, and kidney tissues were analyzed for thiamine and cocarboxylase content in twelve cardiac and ten non-cardiac patients. In six of each group the results were related to the nitrogen content of the tissues. In all tissues examined, there were lower concentrations of both total thiamine and cocarboxylase in patients with cardiac failure than those who died of other causes. The differences were statistically significant for both total thiamine and cocarboxylase in heart tissue and for total thiamine in liver tissue. The finding of the significantly reduced thiamine and cocarboxylase contents of heart muscle is worth further investigation as to its possible influence upon myocardial metabolism in heart failure.

THE JOURNAL OF NUTRITION

Vol. 54, September, 1954

* Effects of dietary calcium and phosphorus levels upon the physiological behavior of calcium and phosphorus in the rat. S. L. Hansard and M. P. Plumlee.—p. 17.

* Congenital malformations as related to deficiencies of riboflavin and vitamin B_{12}, source of protein, calcium to phosphorus ratio and skeletal phosphorus metabolism. R. B. Grainger, B. L. O'Dell, and A. G. Hogan.—p. 33.

* The utilization of carotene. II. From sweet potatoes by young human adults. W. H. James and M. E. Hollinger.—p. 65.

* The nutritional status of Papago Indian children. M. G. Vavich, A. R. Kemmerer, and J. S. Hirsch. —p. 121.

* Effect of dietary amino acid balance on fat deposition in the livers of rats fed low protein diets. M. E. Winje, A. E. Harper, D. A. Benton, R. E. Boldt, and C. A. Elvehjem.—p. 155.

Vol. 54, October, 1954

* An effect of certain nutritionally inert materials on the incidence of experimental dental caries. J. H. Shaw.—p. 177.

* The effect of fat level of the diet on general nutrition. XII. The requirement of essential fatty acids for pregnancy and lactation. H. J. Deuel, Jr., C. R. Martin, and R. B. Alfin-Slater.—p. 193.

* The effect of fat level of the diet on general nutrition. XIII. The effect of increasing dosages of x-irradiation on the protective action of fat on radiation injury. A. L. S. Cheng, R. B. Alfin-Slater, and H. J. Deuel, Jr.—p. 201.

* The effect of dietary molybdenum upon growth, hemoglobin, reproduction and lactation of rats. M. A. Jeter and G. K. Davis.—p. 215.

* The effect of water restriction on the food intake and food efficiency of growing rats. E. W. Crampton and L. E. Lloyd.—p. 221.

* Improving the nutritive value of flour. VI. A comparison of the use of soya flour and wheat germ. B. D. Westerman, B. Oliver, and E. May.—p. 225.

The effect of aureomycin on growth and protein utilization in the rat. M. E. Berry and C. Schuck.—p. 271.

* Dental caries in the albino rat on high sucrose diets containing different amounts of aluminum. W. Wynn and J. Haldi.—p. 285.

Protein metabolism in the pregnant rat. G. H. Beaton, J. Beare, M. H. Ryu, and E. W. McHenry.—p. 291.

* Effect of ascorbic acid on rats deprived of pantothenic acid during pregnancy. G. Everson, L. Northrop, N. Y. Chung, and R. Getty.—p. 305.

Calcium and Phosphorus Metabolism. In studies of calcium and phosphorus retention in relation to dietary intake using labeled calcium, maintenance requirements appeared to be a function of the animal's calcium status at the time of measurement. Calcium-depleted rats excreted a higher percentage of calcium from the body stores, although total calcium excreted from metabolic sources in rats which had received high-calcium diets increased rapidly. This finding is interpreted as indicating that body stores of calcium materially affect the relative absorption of calcium from the gastro intestinal tract and excretion into the tract. Current intake, therefore, appears to be of less influence on endogenous losses than the calcium status of the animal at the time of measurement. In rats with low calcium body stores, total absorption and retention of radio calcium were increased, whereas radio-phosphorus was absorbed and subsequently re-excreted via the kidneys and less was retained.

Congenital Malformations. A high incidence of hydrocephalus, ocular defects, and skeletal abnormalities was observed among the offspring of dams fed a corn-wheat-gluten rachitogenic diet, which was deficient in vitamin B_{12} and riboflavin, and possibly in folic acid. The incidence of malformations was greatly reduced by adding the known vitamins required by the rat. The addition of these vitamins to a diet in which the dietary protein was of soybean origin gave nearly complete protection. Omission of vitamin B_{12} resulted in hydrocephalus, eye defects, and an increased incidence of bone defects. Omission of riboflavin had no effect on the incidence of hydrocephalus or eye defects but increased skeletal abnormalities. A high calcium:phosphorus ratio increased skeletal defects. The alkaline phosphatase activity in the tibiae of riboflavin- and vitamin B_{12}-deficient newborn was lower than normal. The rate of phosphorus deposition in the tibiae of vitamin B_{12}-depleted offspring was also decreased. Thus it appears that a deficiency of either vitamin B_{12} or riboflavin results in defective cartilage formation and a lower phosphatase activity. Consequently, there is a decreased rate of ossification in the skeletal tissue.

Utilization of Carotene. The amounts of carotene excreted in feces associated with three basal diets essentially devoid of carotene and vitamin A but otherwise adequate, and the fecal carotene following the use of the same diets supplemented with sweet potatoes, were measured for two months in a group of three women and five men. Protein of animal origin was furnished by lean meat and nonfat dry milk solids. The three diets supplied each subject daily with the following: Diet 1, 150 gm. meat (raw weight) and 12 gm. milk solids; Diet 2, 150 gm. meat (raw weight) and 120 gm. milk solids; and Diet 3, 300 gm. meat (raw weight) and no milk solids. The diets were fed nine days each in sequence; then for four days, Diet 1 was again in effect. Following the thirty-one-day depletion period, Diets 1, 2, and 3 were fed, supplemented daily with 60 gm. sweet potatoes which provided 3500 mcg. carotene, again in sequence for three nine-day periods. The over-all average value of fecal carotene associated with supplemented diets, representing 216 subject-days, was 53.8 ± 1.6 per cent. There was a comparatively wide differ-

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ence between the percentages for Subperiods 5 (57.6 ± 2.3 per cent) and 6 (48.9 ± 3.2 per cent) which may possibly indicate that differences between the proteins supplied by the milk solids and those supplied by the lean meat affect the excretion of carotene.

Papago Indian Children. Data were obtained for 115 Papago Indian children, some of whom attended Indian Service schools and received a well balanced school lunch, while others attended several private schools where limited lunches which were usually not well planned were served. The data indicated that the children attending the public schools were better nourished. The blood of the children receiving the limited lunches was lower in total vitamin A and ascorbic acid than that of children receiving ample lunches. Also, a higher percentage of the former showed symptoms usually associated with vitamin A and ascorbic acid deficiencies. Likewise, girls from the private school group showed poorer bone calcification. No significant difference between the two groups was found for height, weight, hemoglobin, red cell count, white cell count, volume of packed cells, sedimentation rate of serum riboflavin, cholesterol, glucose, or protein.

Dietary Amino Acid Balance and Liver Fat. Fat which accumulates in the livers of rats fed low-protein diets containing pork, beef, or egg albumin is reduced when the level of dietary protein is increased. Supplementation of these diets with gelatin, fibrin, or threonine plus glycine lowered the amount of liver fat. Lysine in the presence of additional histidine and threonine further decreased the fat in the livers of rats fed low-protein diets containing egg albumin. Excessive deposition of liver fat was not observed with low-protein diets containing fibrin. The suggestion that an accumulation of liver fat may be a general sign of an amino acid deficiency is probably an over-simplification. It has been indicated that the deposition of liver fat may be perfectly normal in animals receiving diets severely deficient in amino acids. Even the albumin diets supplemented with histidine, lysine, and threonine were still deficient in terms of their ability to support normal growth. However, the improvement of the balance of amino acids in the diet, even though the diet may still be deficient in quantity in amino acids, is sufficient to maintain normal fat deposition. It is possible that a specific amino acid ratio may be required for the maintenance of normal liver fat deposition.

Inert Materials and Dental Caries. The inclusion of 10 per cent agar or varying amounts of Cellu flour from 10 to 100 per cent in a caries-producing diet after tooth development was complete did not alter the dental caries incidence in intact cotton rats or in desalivated white rats. The inclusion of varying amounts from 5 to 20 per cent of a finely powdered low-molecular-weight polyvinyl acetate in a purified diet caused a much lower incidence of dental caries in desalivated white rats than in litter mates fed only the caries-producing diet. The inclusion of 20 per cent polyvinyl acetate in the ration in such a way as to produce a firm cake which required a great deal of mastication did not reduce the incidence further than the inclusion of 50 per cent polyvinyl acetate in finely powdered form. The addition of 10 per cent of either high-molecular weight polyvinyl acetate, natural chicle, or arochem in a caries-producing diet produced significantly less tooth decay than the diet alone. These data as a whole do not provide any concrete evidence that the amount of mastication required in the consumption of a purified caries-producing diet is a determining factor in the incidence of dental caries.

Fats and Reproduction. In studies designed to determine whether fats are necessary for successful pregnancy and lactation and, if so, in what amounts, the following conclusions were reached. Dietary fat is not required by the female rat for conception or for the completion of pregnancy when the diets are otherwise complete. However, it is required to insure the survival of the pups after birth. Although, in some cases, daily doses of cottonseed oil as low as 10 mg. insured the survival of the pups for three days, as much as 200 mg. were required daily for optimum results. The optimum daily requirement of cottonseed oil for lactation, as determined by the weight of the young at twenty-one days, was found to be between 100 and 200 mg. The constituents of the fat responsible for the survival of the young and for satisfactory lactation appear to be the essential fatty acids.

Fat Protection against X-Irradiation. The present tests confirmed the earlier experiments demonstrating the protective effects of dietary fat against x-irradiation in a variety of doses and given at several time intervals. The rats on the test diets for only three weeks after weaning exhibited the protective effects of fat against x-irradiation as satisfactorily as did rats which had received test diets for as long as eight weeks after weaning. The survival time of rats receiving a commercial casein diet which was otherwise fat free was considerably longer than that of rats on a fat-free diet containing vitamin-test casein. However, the period of survival was prolonged by an additional interval when cottonseed oil was also added to the diet.

Molybdenum Toxicity in the Rat. Molybdenum as sodium molybdate was fed to weanling rats and to mature rats to study its effect on growth and reproduction. The weight gain of both sexes was retarded, but males were affected to a greater extent than females. Seventy-five per cent of the males which were fed from weaning on a diet containing 80 to 140 p.p.m. molybdenum were sterile. Limited histologic examination showed some testicular degeneration. Fertility and gestation in females were not affected, but there was some interference with normal lactation.

Water Restriction and Food Intake. Experiments with white rats were conducted to determine the effect of restriction of water intake on the rate of weight gain, food intake, and food utilization. The immediate effect was to reduce substantially the voluntary intake of food and consequently to inhibit gain in body weight. Since the greatest and least reductions in average food intake were found for the youngest and oldest rats, respectively, it would seem that the age of the animal may affect the extent of the effect of water restriction on food intake. The food efficiency of all rations, expressed as gain:food ratios, was reduced by over 30 per cent when water intake was restricted.

Nutritive Value of Flour. Comparisons were made of the value of adding soy flour or wheat germ to enriched and nonenriched flour. Results indicated that, when added to nonenriched flour, both were significantly beneficial in promoting growth in rats, but neither supported as good growth as the stock diet. When added to enriched flour, these materials supported as good growth as the stock diet. No significant differences were found in rats receiving enriched flour plus wheat germ as against those receiving enriched flour plus soya flour in either the first or second generation. There was some evidence that soya flour when added to nonenriched flour promoted better growth in the second generation than did wheat germ. Differences in storage of the B-vitamins in the liver were significant for thiamine and riboflavin but not for pantothenic acid and niacin. Significant differences in amounts of thiamine deposited in the muscle tissues were found.

Aluminum and Dental Caries. In these experiments, no significant differences were found in the number of carious molars or in the caries scores as a result of the addition of aluminum, either in non-desalivated or desalivated animals. It may be concluded, therefore, that the difference in cariogenicity of the two diets containing the same amount of sucrose but with different amounts of aluminum, as reported previously, is not due to the small amount of aluminum. The explanation of the lower cariogenicity of one of the high-sucrose diets must be sought elsewhere. The addition of aluminum up to 200 p.p.m. had no effect on the appetite or growth.

Ascorbic Acid-Pantothenic Acid Relationship. A study to learn the effect of ascorbic acid on reproductive performance of rats deprived of pantothenic acid is reported. When 2 per cent ascorbic acid was added to a pantothenic-acid-deficient diet, a "sparing" effect was demonstrated; young born to such animals were usually superior to those borne by animals receiving only the control diet. Blood findings confirmed this; pantothenic acid concentrations of the blood remained normal in animals receiving ascorbic acid plus the deficient diet as compared to a drop in blood levels for animals receiving only the control diet. Pantothenic acid in the tissues of the young at birth and of the mother were also higher when ascorbic acid had been included in the diet. In newborn rats produced by females receiving neither pantothenic acid nor ascorbic acid, there was a rise in blood pyruvic acid and a decrease in the alkaline phosphatase activity of the adrenal gland.

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Overweight is recognized as one of this country's leading health problems. In prescribing diets for the "weight-watcher" it is sometimes difficult to advise on foods which are appetizing, and at the same time help in obtaining the objective of effective and healthful weight loss.

Poultry meat lends itself as an acceptable main dish contribution to the modern diet concept on both counts. It supplies high quality protein and is relatively low in calories. It is therefore important in reducing and maintenance diets for all ages, and can be prepared in a number of taste-tempting ways to relieve mealtime monotony.

Protein and other nutrient contributions of poultry meat are charted below for easy reference.

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FOOD VALUES IN 100 GRAM PORTIONS OF POULTRY MEAT[1]

(About 3½ ounces of raw broiler meat; and 3½ ounces of raw (medium) turkey meat)

	Chicken	Turkey		Chicken	Turkey
Calories...	151	268	P.....	200 mg	320 mg
Protein....	20.2 gm	20.1 gm	Thiamine...	.08 mg	90 mg
Fat.....	7.2 gm	20.2 gm	Riboflavin..	.16 mg	140 mg
Ca.....	14.0 mg	23.0 mg	Niacin.....	10.2 mg	8.0 mg
Fe.....	1.5 mg	3.8 mg			

[1]Food Values of Portions Commonly Used, Bowes and Church, 7th Edition, 1951.

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With ascorbic acid supplementation, the alkaline phosphatase activity was like that found in the adrenals of healthy stock young. In several instances, the protection afforded by the ascorbic acid was equal to that of 100 mcg. calcium pantothenate.

THE LANCET

No. 6845, November 6, 1954

* Abnormal glucose-tolerance tests in patients treated with sedative drugs. W. H. H. Merivale and R. A. Hunter.—p. 939.

Sedatives and Glucose-Tolerance Tests. Glucose-tolerance tests on sixteen patients who were receiving sedatives, mainly barbiturates, revealed abnormalities in all. The glucose-tolerance curves were: "lag" curves, 4 each; prolonged hyperglycemic curves, 7 each; hypoglycemic curves, 7 each; bizarre curves, 5 each. Barbiturates independently interfered with appetite and also directly affected glucose utilization. Careful consideration of insulin dosage during barbiturate medication of diabetic patients should be given.

NUTRITION REVIEWS

Vol. 12, October, 1954

* Food fortification in the Orient. R. R. Williams.—p. 289.
* Nutrition and adult body dimensions.—p. 296.
* Nutritional status studies.—p. 298.
* Food fads and fancies.—p. 306.

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* Trends in nutritional research. J. R. Murlin.—p. 321.
* Potassium administration to patients with low blood sodium levels.—p. 330.
* Human growth.—p. 332.
* Skin changes in nutritional deficiencies.—p. 345.

Food Fortification in the Orient. The author questions the validity of two reports—an FAO (Food and Agriculture Organization) report on *Rice Enrichment in the Philippines* and a report of the Indian Council of Medical Research entitled *Fortification of Foods*. He claims that the first report fails to evaluate the evidence objectively, showing a disregard for the facts. The second report, he says, has value as a factual study, only if the reader has at hand accurate information to supplant the misinformation throughout the text. Examples of the errors in both reports are cited.

Nutrition and Adult Body Dimensions. A study has been undertaken to determine the relative importance of two sets of factors (selective migration and environmental influences, including diet) in influencing the body dimensions of individuals of foreign descent who come to live in the U. S. as compared with their countrymen who stayed at home. Those who emigrate to the U. S. tend to exceed their countrymen in stature and some other body dimensions. Emigrants from a Mexican town were studied. The general increase in body size seems to reflect environmental differences. A more adequate and abundant diet available to younger, still-growing emigrants in the U. S. is considered the probable crucial factor. The relationships between food supply and body weight in Great Britain during the years 1943 to 1949 were also examined. The changes in body weight paralleled the trends in the energy value of the foods consumed, using the domestic food consumption of urban working-class households as the criterion of food supply.

Nutritional Status Studies. Large-scale nutritional studies have been advocated in order to maintain an index of the nutritional conditions among the people in this country. The primary purpose of one such study, covering a variety of population groups in six northeastern states, was to evaluate the methods used and to determine what correlations existed between the dietary, biochemical, and clinical findings. In each state, physical examinations were made by local physicians. Variation in problems and the types of subjects in different states precluded exact standardization of the forms used for the clinical examination. In each state, approximately a third of the subjects were within 5 per cent of their "normal" weight as judged by a standard height-weight table. About the same percentage was underweight, and there was a tendency for the percentage of underweight subjects to increase with age. There was no correlation of overweight with age. Approximately 23 per cent of the men and 20 per cent of the women were in this category. Each state had a small percentage of subjects showing physical signs that might be related to nutritional deficiencies. A report on dietary methodology studies concludes that to secure a valid dietary intake for an individual, daily dietary information covering a week is necessary, but that one-day dietary studies may provide information on the food habits of population groups. Results of biochemical analyses of the blood are described. These reports are of considerable importance in showing the extensive and elaborate planning which must go into any large-scale nutritional survey. A rather exhaustive discussion of the techniques and procedures to be followed in nutrition surveys is presented which will be of value to all workers in the field of human nutrition.

Food Fads and Fancies. A health problem has arisen because of the flourishing activities of food faddists. It is reported that even though our food supply is the best we have ever had and there is a high standard of protection of our food supply, approximately 10 million people in the U. S. are being influenced in their dietary habits by nutritional quacks. The health of a large number of these people is being endangered, both by the unsound dietary recommendations of the faddists and by frequent delays in seeking necessary medical treatment until it is too late to be of value. The nutritional quack is compared with the medicine man of yester-year. Effective dealing with nutritional quackery is largely a continuous educational problem which requires focusing attention on both elementary and adult education. Each qualified individual in the various nutritional areas should take definite responsibilities to participate in such educational programs through whatever medium is possible in his or her own community.

Trends in Nutritional Research. The author discusses several developments in nutritional research which led to further study and discovery, particularly the work of Chittenden which aroused an interest in protein metabolism and which inspired many other scientists to continue research in nutrition.

Potassium Administration with Low Blood Sodium Levels. The effect of administering potassium orally as potassium chloride to six patients with hyponatremia was studied. Potassium administration did not induce either a water or a sodium diuresis. In spite of this, significant and sometimes quite striking rises in the serum sodium concentration occurred after a day or two of this regimen. Rises in the serum potassium concentration also occurred, sometimes to what might be considered dangerous or toxic levels (the highest was 9.5 mEq per liter, rising from 4.5). The author believes that as the patients were neither ingesting sodium in significant amounts nor excreting increased quantities in the urine when the potassium was administered, and as there were no changes noted in the body fluids or urine volume, the most likely explanation is that some of the potassium administered was exchanged for sodium in the cells, releasing sodium which was not excreted but served to increase the serum sodium concentration and correct the hyponatremia.

Human Growth. Several studies related to human growth are described. In one such study, it has been shown in laboratory animals that dietary deficiencies, experimentally induced during pregnancy, result in a variety of developmental defects in the offspring, such as hydrocephaly, cleft palate, and skeletal defects. It is believed that some of these abnormalities must be attributable to vitamin deficiencies and maternal hypoproteinemia. In another study, a statistically significant relationship was demonstrated between the diet of the mother during pregnancy and the condition of her infant at birth and within the first two weeks of life. All stillborn infants, all but one infant who died within a few days after birth, most of the infants with marked congenital defects, all premature infants, and all functionally immature infants were born to mothers whose diets during pregnancy were considered to be very inadequate. The relationships among nutrition, growth, and development are complex. Genetic endowment provides the limits within which nutritional factors can operate, and the endocrine system is importantly involved. The X-ray analysis makes it possible to distinguish the poorly from the adequately mineralized skeleton and to judge skeletal age from the presence or absence of ossification centers and epiphyseal fusions, as a useful measure of general body maturity. Thus it provides an important research tool and a useful supplement to the clinical evaluation of nutritional status.

Skin Changes in Nutritional Deficiencies. Careful histologic examination has been made of the skin of rats

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deficient in vitamin A, vitamin B_6, and essential fatty acids. In the vitamin A experiments, the skin of the deficient animals was abnormal, but the changes were quite different from those reported as accompanying follicular hyperkeratosis in human beings. The skin changes resulting from fatty acid deficiency were markedly different from those observed in vitamin A deficiency. The histologic picture of the skin from rats deficient in essential fatty acids resembled strikingly the picture seen in follicular hyperkeratosis in man. Changes resulting from vitamin B_6 deficiency resemble those observed in vitamin A deficiency. It is tempting to speculate that follicular hyperkeratosis is the result of essential fatty acid deficiency. This can be proved only by careful nutritional study and such a study seems to be strongly indicated.

PUBLIC HEALTH REPORTS

Vol. 69, November, 1954

- Milk sanitation, communicable disease, and public health. J. H. Steele.—p. 1065.
- Estimated prevalence of overweight in the United States.—p. 1084.

Milk Sanitation, Communicable Disease, and Public Health. The author discusses several diseases which are transmissible to man through milk or through contact with infected animals—tuberculosis, brucellosis, Q fever, anthrax, Salmonellosis, streptococcal and staphylococcal mastitis, torulosis, and foot-and-mouth disease. It is stated that the methods of prevention are pasteurization, control of the disease in animals, and sanitation practices. The use of pasteurization alone should not be considered a foolproof method, although it has cut down considerably the prevalence of milk-borne diseases. Sanitation is an essential part of any communicable disease control program. Milk plants and dairies should be checked regularly, and inspections should be made of the water supply, toilets, sewage and manure disposal, and cleanliness of barns, cow-yard, milk-house, utensils, animals, and man. Public health practices must be successfully coordinated if a communicable disease program which has depth as well as practicability is to result.

Overweight in the U. S. It is estimated that 20 per cent of the population of the United States are overweight. Overweight is defined as 10 per cent or more actual weight above "standard" or "desirable" weight for individual based on tables of height, weight, and body type. There was a relatively higher percentage of Negro women than of white women in both the 10 and 20 per cent overweight categories.

SCIENCE

Vol. 120, November 12, 1954

- Folic acid deficiency in the dog. D. Afonsky.—p. 803.

Vol. 120, December 3, 1954

- Advances in calorimetry. W. DeSorbo.—p. 932.

Folic Acid Deficiency. Folic acid deficiency was observed in a control dog used in nutritional studies that was consuming a basal ration consisting of vitamin test casein (GBI), 18 gm.; sucrose, 68 gm.; vegetable oil (hydrogenated), 10 gm.; salt mixture USP XIV, 4 gm.; and bone ash, 4 gm.; plus vitamin supplements of thiamine, riboflavin, calcium, pantothenate, pyridoxine, choline, inositol, para-aminobenzoic acid, vitamin A, vitamin D, alpha tocopherol, and 2-methyl-naphthoquinone. The control animal started to lose weight soon after being placed on the synthetic ration, and after 278 days had lost 12.5 per cent of its initial weight, and hematrocrit values showed a progressive and steady decrease. Curative measures using iron, choline, and vitamin B_{12} medications failed to produce improvement in the animal's condition, but administration of folic acid resulted in prompt response, with blood values returning to normal within fourteen days. However, they soon started to decline again. Autopsy revealed hypoplasia of the bone marrow and lingual lesions. When given alone, folic acid had no effect on niacin-, riboflavin-, pyridoxine-, and pantothenic acid-deficient animals or on control animals. It appears, contrary to previously published reports, that some dogs may require preformed folic acid in the diet.

Advances in Calorimetry. Papers presented at the 9th Annual Calorimetry Conference are reported briefly. Among the topics discussed were the latest developments in cryostat designs for measuring heat capacities from below 1°K to room temperature. A unit designed for measuring thermal capacities of liquids and liquid mixtures was described. The calorimeter heating is continuous and the adiabetic control is automatic. The specific heats of sodium, potassium, and rubidium have been measured in the temperature range of 13° to 325°K.

ADULT LEADERSHIP

Vol. 3, December, 1954

- Personalities in interaction. H. Runner.—p. 18.
- Personality on the job. K. Runner and J. Runner.—p. 22.
- Personality in administration. D. H. Jenkins.—p. 25.

Personalities in Interaction. Each personality, though not unusual in itself, has some specific characteristic which cannot be transformed to another personality. Some people must conform to a group opinion to satisfy their personalities; others must enforce their independence and independent ideas. In group interaction, each person has one primary need which he will seek in fulfilling his dealings with others in the group. The author of this article takes three different personalities and uses an example of their interaction in a group. One of the persons could be called "a personality boy—the live wire in any group." One is "a sweet person, so agreeable." The third person is one, about whom many would say, "you always know where he stands; you can't change his opinions." The first person has a secret desire for admiration and applause; the second, always sweet and agreeable, needs loving approval; and the third is the most business-like of the three, finding it easier to decide between right and wrong, than to compromise with a decision between these extremes, living by principle, rather than reasoning out a problem. He wants people to respect his judgment and believes it is his duty to influence others in the way he thinks—what he thinks is the right and only way. How do these three personalities interact in a group? The author gives us an example of the three personalities in a group situation—that of a "membership drive" for a church. In this situation, we can see the behavior and understand it in each person of the group and also see how they compromised on one policy. To work with and understand people, we must realize that each person must gain approval for his individualism if he is to live and work in harmony with other people.

Personality on the Job. When asking a person to assume a task, one must consider the worker's personality and attitude toward a certain job. For instance, some people are highly imaginative as compared to those who are very theoretical in the ways in which they think and approach a problem, and also in things that are of interest to them. The way in which a person looks at a problem is part of his personality. A person's training, education, years on the job, and so on can be looked at objectively when selecting someone to do a certain job, but a man's ability to stimulate others, or to develop new ideas, or to carry out a job meticulously cannot be looked at objectively. These things are not so easily subject to definition, measurement, and agreement. These things are part of a man's personality and are not recently acquired skills, but traits which have been accumulated during the person's lifetime. These personality traits often mean the success or failure of a person in a job. For instance, as cited in this article, tests given to foremen in a midwest factory showed that comparatively the foremen who were most successful in achieving high production in their sections were not necessarily those who achieved the highest grades in intelligence and skill tests, but rather those who worked most successfully with the men under them and had the highest grades on leadership tests. The tests found that a leader who shares the same general values, outlook, concept of duty as the majority of his subordinates obtains the greatest rapport and good communication and is successful.

Personality in Administration. In a recent study, elementary school teachers in a large city were asked to indicate how recently they talked to other teachers about their problems and also how often and how easy it was to talk to their principals. The schools which were represented in the study could be divided into three different types: (a) high communication schools, (b) low communication schools, and (c) mixed

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communication schools. It was learned that the amount of and kind of communication which was carried out in these schools depended on the principals. In each type of school, the principals could be classified as to their policies on freedom and structure, communication and group building, personal relations, and concern with methods and details. The principals' attitudes on these different subjects were reflected in the way the school was run and to a great degree the happiness of the teachers. In the schools with high communication, the principals believed in freedom for themselves and everyone else who associated with them, and they encouraged and believed in new ideas. They made contacts easily with others, had warm personalities, felt themselves to be part of the main group, and were popular with all people with whom they came into contact. Those of the low communication schools were more interested in organization and structure than they were in group interactions. They believed themselves to be right all of the time, and they did not welcome new ideas.

AMERICAN RESTAURANT MAGAZINE

Vol. 38, November, 1954

* Planning, equipping and maintaining an efficient cafeteria. C. E. Blackburne.—p. 44.

Favorite recipes from well known restaurants. L. Weaver.—p. 50.

* Fine stuffing makes fine birds. L. D. Freeman.—p. 70.

* It can happen in your restaurant. J. B. O'Meara.—p. 96.

Vol. 38, December, 1954

* Suggestions for better service. J. B. O'Meara.—p. 50.

* Expendable equipment required for a cafeteria. C. E. Blackburne.—p. 90.

Cafeteria Planning and Equipment Maintenance. Certain equipment for preparing and serving large quantities of cooked food is a basic requirement. Other equipment may be added for saving labor cost and improving quality as it is found necessary. In this article is a check list for selecting such storage and preparation equipment depending on various factors. Especially useful to management is an outline for maintenance inspection of electrical appliances, lubrication of motors, adjustment of scales, and checking of refrigeration and range equipment. Various types of cooking equipment and labor saving machines are discussed. Important specifications for fabricated equipment which is durable, easy to maintain, and sanitary are pointed out. It is suggested that some tables be placed on rollers so that they may be moved to points where needed. Information on quantities of dinnerware and tableware to purchase is also given.

Accident Prevention. A stairway is a common but overlooked hazard. Falls are caused from stairways which are slippery, worn, broken, wet or icy, inadequately lighted, or on which loose objects are kept. Handrails are well worth the money they cost. Obstacles may be painted in outstanding colors. First aid training for employees is important. Floors, too, may be hazardous; grease, bottle tops or broken tops, or broken glass on floors can cause falls. Disaster from fire can be prevented through training. Look for frayed wires, broken electrical fixtures, defective chimneys and flues, greasy rags, and the careless use of matches.

Suggestions for Better Service. This article gives suggestions for better food service and emphasizes the importance of the attitude of the restaurant manager in creating good and uniform service for customers. Among the important service aspects discussed are those dealing with menus and how well or how poorly a menu is kept up. In other words, does the restaurant always have the items that are offered on the menu? Do menus tell the true story of what the restaurant has? Is the service uniform? The article contains pointers on sanitation, waiters' and waitresses' tips, noise in restaurants, unpleasant habits of waiters and waitresses, such as cleaning an ashtray with a soiled napkin at the table.

Requirements for a Cafeteria. A table of expendable equipment needed for feeding 250 to 400, 400 to 800, and 800 to 1300 people is given to help in planning a self-contained cafeteria with full food storage, food preparation, and serving facilities. The equipment is planned with the assumption that "self bussing" will prevail and that the diners will move quickly, select items promptly, and leave tables when finished.

COLLEGE AND UNIVERSITY BUSINESS

Vol. 17, December, 1954

* Day in a campus kitchen. W. H. Miller.—p. 46.

Day in a Campus Kitchen. Some of the problems the manager of a college dining hall faces are these: (a) he must plan the day's menu in accordance with requirements of nutrition; (b) he must serve meals that are attractive, interesting, and appetizing; (c) he must stay within a limited budget; and (d) he must maintain proper standards in sanitation, efficient and speedy service, and close harmony between kitchen and administrative staffs. These problems are faced by all food service managers, but the manager of a campus food service has the added problem of student morale, for the quantity and quality of the students' food might well serve as a barometer of their morale. At Virginia Polytechnic Institute this was a special problem, because the town of Blacksburg, where the Institute is located, has few commercial eating places. Thus, the students and their guests are dependent almost entirely on the campus food service for their meals. The Institute maintains high standards of sanitation by setting up methodical rules which are carefully followed and by using many paper utensils.

FOOD ENGINEERING

Vol. 26, November, 1954

* Fine points of sanitation that up cottage cheese quality. P. R. Elliker.—p. 79.

* Blazing the trail to superior powdered flavors. J. J. Broderick.—p. 83.

* Cools produce "by the car," cutting labor, handling, time.—p. 88.

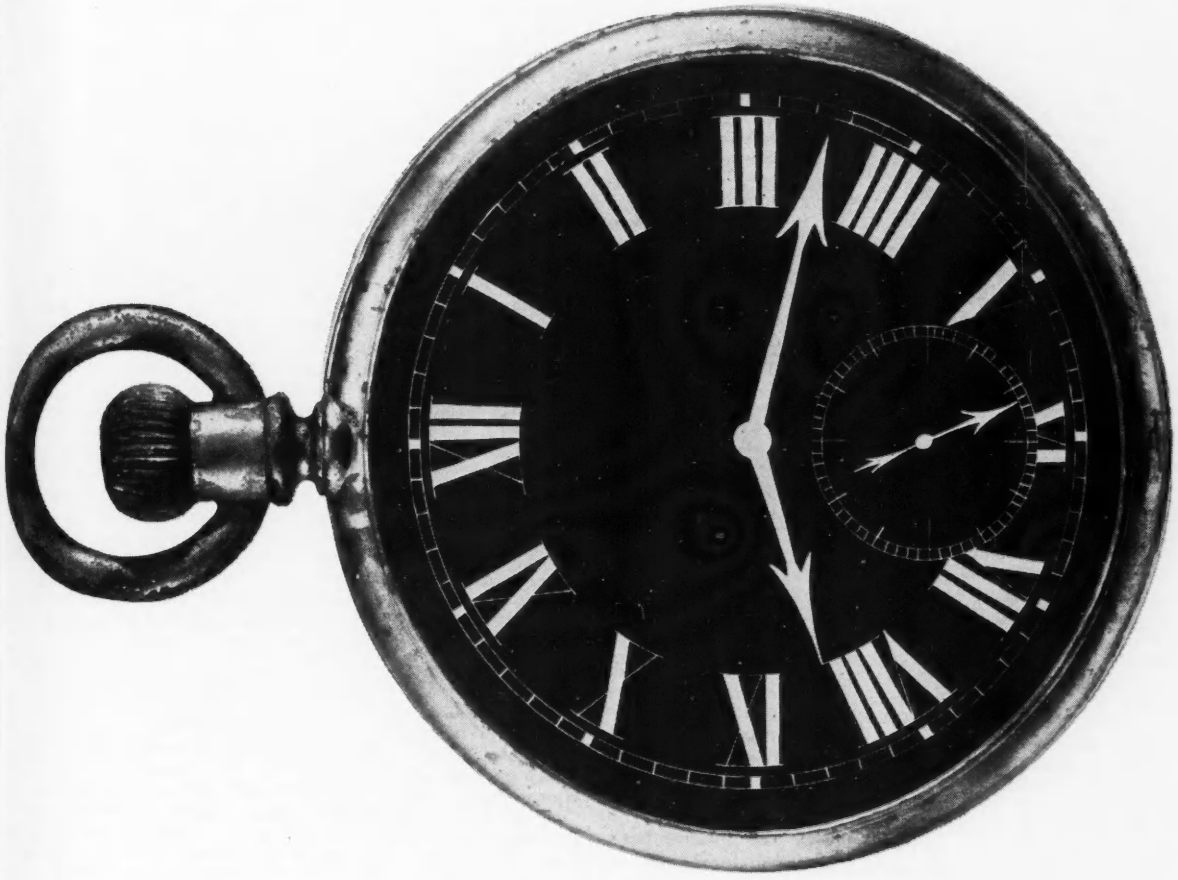
* The jet comes to refrigeration.—p. 89.

Cottage Cheese Sanitation. The first step in sanitation is to learn to recognize the common defects and then pinpoint the causative factors. Flavor changes usually precede advanced stages of spoilage caused by some microorganisms. Spoilage, such as yeasts and molds, may be the result of bacterial action. Bacteria enter by way of soil and water. The equipment, water supply, fresh and dried vegetables used for salad cheese, vats themselves—these all may bring in bacteria. Extreme sanitary practices are necessary to prevent this. Cleansing of equipment should be frequent. High *p*H, alkaline cleaners, well fortified with a wetting agent and polyphosphates should be used on vats to remove protein film baked on the surfaces while cooking the curd and on storage cans to prevent accumulations of milkstone and contamination. Stiff-bristled brushes should be used in place of metal sponges for the sponges produce deep scratches which are easily filled with new deposits. Hypochlorites are the choice for sanitization of cottage cheese equipment. Chlorinated water should be used for cottage cheese washing but over-chlorination should be eliminated. *p*H, if carefully controlled, will help inhibit spoilage. The keeping quality of cheese should be tested periodically.

Powdered Flavors. Work is going on constantly to improve flavors in powdered form. Gelatin is effective to seal in flavor oils, but its use is limited due to physical properties and the cost of the gelatin. Sorbitol has recently been used as a coating material for the flavor oil, but when used alone, the high temperatures needed for its dispersion damage many delicate flavors and sorbitol tends to crystallize and to release the flavor when stored. The most popular and effective powdered flavor on the market today is spray dried with a vegetable gum base, usually gum arabic. The gum is less expensive than gelatin, is reasonably soluble, amorphous, and therefore does not crystallize. Experiments are constantly being made on combined coatings to overcome the disadvantages of the single coating and yet are in the same price range as liquid flavors.

Cooling. A new vacuum process has been devised for cooling lettuce by the car load rather than the case. The cars are loaded in the fields and then put immediately into oversize vacuum chambers for cooling, thus reducing handling, labor, and elapsed time from field to consumer.

Refrigeration. A new super-saturated refrigerating system chills foods faster and with less evaporation loss. So far, the process has been largely applied to meat in the carcass stage where it saves 6 hr. in cooling from body heat (120°F.) to cooler room temperature (34°F.). Meats can be held for as long as three weeks without evidence of slime formation or discoloration. Less shrink-



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age is also an advantage. It is pointed out that the cooler uses more power and refrigeration, but that it is a completely closed system, the compressor is more efficient, more meat can be cooled at one time, and it packs a tremendous amount of refrigeration in a relatively small space.

FOOD SERVICE

Vol. 16, November, 1954

* There's money in soup.—p. 13.
* Solid, satisfying soups.—p. 18.
* Dishwashing: a behind-the-scenes effort that makes or breaks the front of the house.—p. 43.
* Common-sense rules result in attractive waitresses.—p. 47.
* Honey—a cooking asset.—p. 48.

There's Money in Soup. Soup, one of the lowest cost, most profitable items sold, is becoming very popular. It is now wise to serve a standard product rather than using mostly leftovers as was once the practice. Portion cost figures for soup bases are: chicken, 1.6 cents, and beef, 2 cents. The estimated profit on some soups is around 300 per cent. The degree to which Americans like soup with their noon meal is 32 per cent contrasted with pie at 13 per cent; meat, 48 per cent; sandwiches, 23 per cent; milk, 47 per cent; salad, 32 per cent; and bread, 65 per cent. At the evening meal, soup rates 17 per cent; salad, 45 per cent; meat or fowl, 70 per cent; sandwiches, 7 per cent; vegetables, 60 per cent; and pie, 16 per cent.

Thick Soups. Indications are that soup has given some ground as a dinner appetizer, but has become more popular as a major item in food selection. As a result there has been a development of new thick soup recipes to give the patron a feeling of fullness. In this day and age of canned soups and soup bases, chowders and similar types of dishes may be easily produced with the use of good recipes. Chowders appeal to male customers. Chili is low cost and sells well. And don't overlook proper service, for it is as important with relatively simple items as with complicated dinner entrées.

Dishwashing. Each operation in food service is necessary to over-all success. Although a dishwashing crew may never actually meet a customer, the customer is in almost daily contact with their work. Three objectives for the employee should be: (a) Learn all you can about your job and the duties of your co-workers. (b) Make cleanliness your prime consideration. (c) Be expense-minded. Equipment costs money. It is good practice to check dishwashing equipment, such as valves for leaks, to make sure it is in working order at all times. Each employee should make sure his station is cleaned daily. He should also remember to avoid unnecessary waste by careless handling of china and glassware. Overuse of soap powder is wasteful.

Attractive Waitresses. A well groomed waitress with a pleasant smile is top advertising for any food establishment. Plenty of sleep makes it easier to smile. Body odors should be avoided and uniforms should be kept clean and in good repair. Hands should be manicured and skin, particularly arms and elbows, soft and not scaly. Wear run free hose with straight seams. Wear well-fitting shoes, polished, with clean laces.

Honey. Honey is capable of adding a subtle flavor. It is more economical to plan a year ahead when purchasing honey. Store in a cool, dry place. To liquify for measuring, place the container in warm water. Use low temperature cookery. A pleasant tasting topping for waffles can be made by blending ½ c. margarine with ¼ c. honey. To bake ham with honey, combine 1 qt. sweet pickle juice with 1 c. of honey for every 10 lb. ham. Honey may also be used for glazing carrots, apples, and the like. Breads, rolls, and muffins that taste of honey are delicious and afford variety.

HOSPITAL MANAGEMENT

Vol. 78, November, 1954

* You can avoid resentment among hospital personnel. As the Editors See It. F. D. Hicks.—p. 22.
* These canned vegetable recipes will brighten your menus. D. York.—p. 94.

Avoiding Resentments. Resentment among hospital personnel can be both disturbing to everyday work and expensive. Human relations permeate everything hospital people think or say or do. Professional jealousy is a form of disturbed human relations which hospital administrators often are forced to note. Proper handling of situations involving human relations can save the hospital money. A good administrator can adopt the objective attitude of the psychiatrist when he is faced with a human relation problem. There should be more than a little compassion brought to any examination of disturbances involving personnel relationships. The administrator should ask himself why a situation has arisen before he starts taking action. He should also be willing to talk things over with people on his payroll who know what they are talking about and who were hired for that reason.

Use Canned Vegetables. The requirements for mass feeding techniques are easily and economically met by canned foods. Dr. Willard Krehl of the Yale University School of Medicine showed that, based on comparable quality and the basic element of edible pounds, canned foods cost less per edible portion than foods in any other form. Time in cleaning, preparation, and cooking is saved by using canned vegetables. This allows more time to add creative touches to meals. Recipes are given for ideas on how to brighten your menus easily and inexpensively with canned foods.

HOSPITALS

Vol. 28, December, 1954

* A definite time and place for writing menus.—p. 107.

Many hands assist small hospital dietary departments.—p. 110.

Menu Writing. Menu construction, listed as one of the seven factors inherent in good management of food services, might be moved to the top of the list, as the other six factors depend on the menu. These other factors are purchasing, receiving, storing, issuing, food cost testing, and control of funds. Menu planning is one phase of food service administration in which particular attention must be paid to minute details. To carry out menu construction successfully in a hospital, the dietitian must have close communication with the patients and the personnel to be fed, thorough understanding of the employee work force and potential abilities, and a knowledge of the available facilities in order to distribute the work load properly. The hospital should have a predetermined menu policy which will coincide with the food budget. The dietitian must also have these goals in mind: (a) to serve appetizing and nourishing meals to patients and personnel; (b) to modify diets served to patients who require them; (c) to provide good food as economically and efficiently as possible; (d) to maintain good personnel relations; and (e) to create good public relations. One of the most important factors in achieving these goals is to have a good master menu. In planning menus, it is important that the hospital dietitian have a good planning center, one where source materials, such as reference books on nutrition, diet manuals, index of menus previously served, standardized recipe file, menu suggestion lists, and an up-to-date report of supplies on hand, are readily available. The planning center should be quiet and free of confusion. In organizing a menu-planning center, the hospital will benefit in both the quality and cost of hospital food. This article is accompanied by a dietitian's checklist for evaluating menus.

INPLANT FOOD MANAGEMENT

Vol. 1, December, 1954

* Potentials of plastic. D. Jaffe.—p. 6.
* Hot cocoa for quick energy. D. Jaffe.—p. 32.

Potentials of Plastic. Melamine is gaining quick acceptance, in the form of tableware, for inplant food service operations. This acceptance can be attributed to the following advantages: (a) it is resistant to chipping and breaking, requiring little, if any, replacement; (b) its light weight makes it easy to handle; (c) it reduces handling noise to a minimum; (d) it has low thermal conductivity, does not require warming before service, and food tends to stay hot on it; (e) it is available in pleasing, durable colors and simple design; and (f) it handles well in dishwashing machines, being unaffected by detergents or cleaning fluids. One disadvantage is that the cups stain from tea and coffee, and although the stains can be removed with special cleaners, over an extended period of time, the stain becomes harder to remove and the cups must be discarded. In interviews with Melamine users, it was found that this type of tableware has an exceptionally low replacement record. To protect consumers from poor imita-

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promoting better health through nutrition research and education.

tions, the manufacturers established an industry standard for the Melamine ware in 1950 which covers chemical and physical properties and methods of testing for heavy-duty tableware molded from the Melamine material. The product, which is found under many different trade names, has been the object of some controversy in the matter of sanitation. This article gives proper recommendations and instructions for the sanitary washing of the tableware.

Hot Cocoa. Cocoa, or hot chocolate, is a good addition to an inplant cafeteria service because it offers employees greater variety in hot drinks, is nutritionally excellent, and is profitable to the cafeteria. In interviews with cafeteria managers, the pros and cons, the successes and failures of the service of cocoa in plant cafeterias were discussed. The different ways in which cocoa is served are cited. For instance, some managers use powder packets which are emptied into an electrically heated container to which cream and water or milk are added. With this method of service, there are never any wasteful leftovers. The greatest disadvantage is that it requires extra time and labor and holds up cafeteria lines. Using a cocoa dispenser is perhaps the best way to serve the drink, but the dispensers are expensive and the manager, in taking on such a heavy expense, must be sure that there is sufficient demand for the product. Some of the cafeteria managers who were interviewed found that in making cocoa available, they created a demand for it. Others used well-planned promotion to increase the demand, both during breaks and with meals.

INSTITUTIONAL FEEDING AND HOUSING

Vol. 3, November, 1954

* Equipment solves tricky space problem. H. L. Post.—p. 2-FH.
* Food cost control starts with buying. J. H. Miller. —p. 16-FH.

Vol. 3, December, 1954

* Floor maintenance chart.—p. 16.
* Get most from your part-time help.—p. 24.

Food Service Space Problem. At the world headquarters of a large business corporation in New York, between 900 and 1000 lunches are served daily in the cafeteria. The cafeteria, in which twenty people are employed, operates at maximum efficiency between 11:45 a.m. and 2 p.m. The dining area is separated from the storage, preparation, and cooking areas, thus sparing the diners kitchen noises. These areas are located in another building connected to the cafeteria by ramps. The dishwashing room, also located in an adjacent building, is connected to the cafeteria by a conveyor belt on which the diners put their dishes when finished eating. The article contains illustrations of the kitchen equipment and a floor plan of the kitchen, serving area, and dining room.

Planned Buying for Cost Control. The food purchasing steward of a large hotel tells how he controls his food costs through the use of on-the-spot buying and coordination of menus. By making daily trips to the local markets, the hotel is sure of better quality for its money and close control of pilferage, waste, and inventory. Meat for the hotel is picked out weekly at the supply house, and then it is delivered as it is needed during the week. Upon delivery, the meat is weighed, and the weight of the meat on arrival determines the price per pound. Vegetables are bought daily, and all perishables are transported in the hotel's own truck and then weighed on delivery. The hotel has separate cold storage rooms for vegetables, meats, fish, and poultry, and the food control department, under the chief accountant, takes inventory once a month. This buying process is coordinated with menu planning, for the menus prepared by the chefs are based on the quality and price of daily market offerings, thus saving both the hotel and customers money.

Floor Maintenance Chart. A two-page chart gives pointers on how to save money by applying proper floor maintenance. The chart considers all types of floors, including old wood floors, new tile floors, and floors of tile and stone. The chart gives proper methods of cleaning, sealing, maintaining, and inspecting.

Part-Time Help. Although the value of students as part-time help has been a matter of debate, the restaurateur using proper training methods and making students feel that they are an important part of the business can obtain successful results from the student help. Proper supervision and understanding in dealing with the part-time student help will also make up for the lack of experience. This article gives seven pointers on how to encourage initiative of the part-time helper, at the same time improving service to customers.

INSTITUTIONS MAGAZINE

Vol. 35, December, 1954

* Safety becomes employee project.—p. 6.
* Choosing maintenance cleaners. D. E. Anderson. —p. 14.
* Reviews sources of food-borne illnesses. R. R. Marsh.—p. 31.
* Wrap and package frozen food. A. M. Macfarlane. —p. 34.
* Prescription for longer wear, beauty of asphalt tile floor. J. W. Hillyard.—p. 72.
* Multiply kitchen efficiency.—p. 102.
* Organizing food service.—p. 109.
* Serve more meals—cut labor costs. J. A. Crowe.— p. 116.

Employee Safety Project. The employees of a large New York hotel, which has achieved a remarkable record for elimination of safety hazards in the last few years, has made accident reduction an enthusiastic project through the organization of a Safety Committee. The Committee is composed of the hotel's chief security and safety officer, the personnel director, the manager, the general manager, building superintendent, executive housekeeper, executive chef, chief kitchen steward, and the safety engineer of the hotel's insurance agency. The Safety Inspectors Committee, which is subordinate to the Safety Committee, consists of thirty employees from different departments, who are appointed for a period of three months by their department heads. They wear badges designating their position, at the same time impressing the importance of safety on other employees. The inspectors must make routine weekly surveys of their departments and report all safety hazards and safety conditions. If a hazard is located, the inspector must immediately correct it. Once a month the inspectors must make an over-all report to the Safety Inspectors Committee. In addition to this committee work, the hotel posts "safety joggers," which are posters reminding employees of safety through the use of slogans and cartoons.

Choosing Maintenance Cleaners. There are three main types of maintenance cleaning compounds—powdered soluble cleaners, liquid cleaners, and abrasive cleaners. Of these three types, there are many on the market by different manufacturers. All of them, of course, claim to be good, yet some which are good for one type of floor are not good for another type. This article is a survey of the basic types of cleaners, telling how to test the cleaner for different cleaning requirements, what hidden factors are contained in cleaners, what the safety factor is, how safe different cleaners are, and how one can tell the type of cleaner that is best for a particular cleaning job.

Food-Borne Illnesses. The objective of any food service sanitation program is the protection of patrons from illness due to food. To do this successfully, those in charge of the sanitation program must know the "enemies" and protect the patron by eliminating the sources of food-borne illnesses. The agents which cause illness when they get into foods may be divided into: (a) outright poisons, (b) poisonous plants, (c) poisonous animals, (d) infectious animals, and (e) infectious bacteria. This article, which is one of a series, deals with outright poisons. Most outright poisons which sometimes get in foods are those which are used to kill insects or rodents. Naturally these poisons—for example DDT, lindane, and chlordane—get into food accidentally. Some of the ways in which a food service manager, or the head of a sanitary program, can eliminate the possibility of poisons getting in foods are: (a) make sure that all containers are tightly covered if and when any type of poison is used; (b) make certain that poisons that might have a resemblance to food, such as white powdered poisons, are distinctly colored and kept away from all food; (c) most important, use modern pest control services and techniques to rid a food establishment of insects and rodents instead of doing the job yourself. In this way the possibility of food-borne illness hazards to customers is eliminated.

How to Wrap and Package Frozen Foods. When freezing and packaging frozen foods, precautions must be taken to eliminate: chemical changes in the food due to exposure to the air, which

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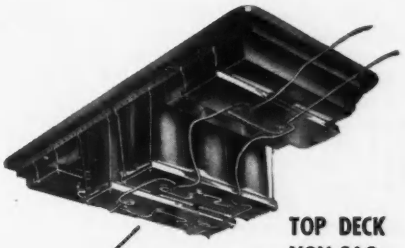
gives you more capacity for selective menu service . .



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The top deck is equipped with two full size meat pans in addition to six deep wells. A variety of sizes in square and rectangular insets are available. This flexibility of pan arrangements provides a greater capacity for serving a number of meats, vegetables and other solid foods.

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Six deep wells provide ample capacity for soups, beverages and other liquids. Two of the wells can be used either hot or cold with an exclusive Ideal toggle switch arrangement, at slight additional cost. Full packed glass fiber insulation keeps foods hot longer, insures food service at oven-hot temperatures.

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IDEAL'S Menu-Master is available in both indoor and outdoor models. Outdoor truck assembly is illustrated at right.

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The trend toward special diets in today's modern hospital demands greater flexibility in the top deck arrangement of your food conveyor. IDEAL'S Menu-Master, Model 1062, has it!

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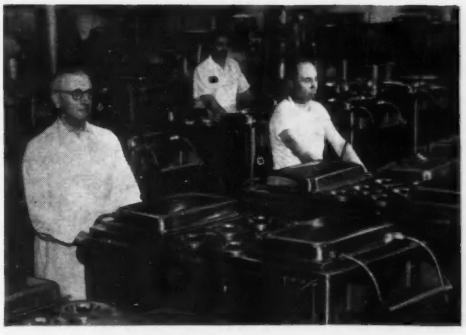

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cause loss of color; development of off-flavors and loss of vitamins; and physical changes which cause loss of weight and fresh appearance due to moisture loss. Most of these common problems of frozen foods are eliminated with the use of effective wrapping materials and containers. This article discusses the different types of wrapping materials and containers and the types of foods that are benefited most by the use of the different types of containers. The article also covers storage life and temperatures, freezing temperatures for prepared and precooked foods, and thawing and reheating frozen precooked foods.

Care of Asphalt Floors. More asphalt floors are scrubbed away than worn away by normal traffic and usage. Being of relatively recent origin and of a sensitive resiliency, asphalt tile floors, though simple to care for, present distinctive problems in the matter of treatment. If asphalt tile floors are improperly handled, they tend to become dull and muddy in appearance, crack, or curl. They can be quickly ruined by such solvents as naptha, turpentine, oils, or fats which cause a spongy condition and make colors bleed. Also, improperly cleaned floors have a tendency to become slippery. This article gives some "don'ts" of asphalt tile care and suggests that a simple rule is to clean with a good neutral chemical cleaner; protect with a resilient-type of non-varnish, non-shellac, non-lacquer seal; and wax with a water-emulsion, self-polishing, anti-slip wax.

Multiplying Kitchen Efficiency. The problem of serving an increased number of meals from a kitchen that was designed years ago is one that is common to many institutions today. St. John's Hospital in Santa Monica, California is a good example of how the capacity of a hospital kitchen can be greatly increased without expensive space additions. The hospital remodeling called for the retention of all possible equipment, but improvement in all other features, such as better lighting, easier maintenance, and improved traffic flow. In the original floor plan, there were a number of layout deficiencies that caused extra work and inefficient use of manpower. To utilize all available space, an unused nurses' dining room was converted into a dishwashing area and an entryway was walled to provide more scullery space and a vegetable preparation area. These two changes provided the kitchen with about 1000 sq. ft. of additional working space. An automatic conveyor-belt assembly line, supervised by a dietitian, replaced an L-shaped, manually assembled tray table. The remodeling was centered around this principal feature of the new kitchen. The article shows the old and new floor plans, and photographs of the equipment which has been installed are included.

Organizing Food Service. This article answers the question, "How can the methods of organization that work in industry be made to work in the food service industry?" The food service business has been slow in adapting the methods of organization used in industry, because food service differs greatly in that it is made up mostly of small, independently operated and owned units. Large operating units in the field vary greatly in the types and numbers which are fed, and therefore do not lend themselves to specialization. Nevertheless, clearly defined organization is very important in commercial food service. Organization should be planned, and in planning it, the function of the organization should be given major consideration. The purpose for which a food service business is established is to provide the patron with well-prepared, palatable, interesting, sanitary, nutritious food. The food service should be organized so that it facilitates this purpose, but does not interfere with it. The organization might look one way on paper, and yet actually its method of functioning might be different. Planned organization must allow for flexibility in cases of emergency. The types of organization discussed are (a) line organization, the simplest type, where each person is directly responsible to one other person, who in turn is responsible to one person only; (b) line and staff organization, the type most frequently used in large food units where the organization is built around the functions that are performed in carrying out the necessary operations; and (c) committee organization, which makes use of a group of people all of whom are directly concerned with the purpose for which the committee was organized, and where the committees serve in an advisory capacity to the heads responsible for different functions.

Money's Worth in Remodeling. The remodeling of a kitchen is often needed because of the age of the facilities and equipment, which make a kitchen hard to operate, and require extra work to maintain high sanitation standards. These were the problems present in a Spokane, Washington dining room. At the cost of $175,000, the remodeling gave the hotel twelve advantages that made the remodeling expense well worth the price. In addition to decreasing costs of operation, the dining area increased the turnover of customers, provided for more efficient service and more seating space for the patrons, as well as being attractive in appearance. The new equipment is durable and efficient and provides for better sanitation practices, which in turn cut down on the labor cost. The dining room was planned with special consideration for every type of patron, those wanting a dinner, those who want just a snack at the counter, and those who wish to buy carry-out and bakery goods. The use of conveyor belts and a modern communications system save time and steps for both waitresses and busboys. Sanitation improvement is facilitated by the addition of new refrigerator equipment and garbage disposal units. Also, most of the working surfaces are stainless steel, and the floor is entirely terazzo, making it difficult for any germ-carrying wastes to find a surface to penetrate.

THE MODERN HOSPITAL

Vol 83, December, 1954

* Efficiency starts with good planning. E. A. Jones. —p. 110.

Food Service Efficiency. Food service efficiency depends mainly on kitchen efficiency. This article, with the aid of a diagram showing units essential to the efficient operation of a main kitchen and a flow chart, demonstrates how to plan a kitchen or how to evaluate the efficiency of an existing kitchen. The kitchen is divided into units, each of which must accomplish a particular phase of work in the task of moving the food in one direction, without backtracking, to patients and personnel. These different units are (a) receiving, (b) storage, (c) preparation, and (d) serving. Under these main units are sub-units, such as dishwashing, refrigeration, housekeeping, and office. This article, although using a hospital kitchen as its example, can be applied to any type of food service.

PERSONNEL JOURNAL

Vol. 33, November, 1954

* Ways to select supervisors. M. M. Mandell.—p. 210.

Vol. 33, December, 1954

* Your people can read better. G. S. Odiorne.—p. 256.
* Empathy in personnel management. I. J. Schultz. —p. 258.

Selecting Supervisors. The author discusses the four most-used methods of selecting supervisors. He points out the advantages of careful selection in regards to both non-supervisory employee relationships and better business relations and service. The four methods discussed are: (a) Supervisory Judgment Test, which contains multiple choice questions of judgment in the areas of interpersonal relations with subordinates, superiors, and colleagues, and personnel responsibilities, such as the training of employees, employee communications, and proper assignment and utilization of employees; (b) Group Oral Performance Test, where a group of candidates are judged at one time on their ability to discuss and solve a common task; (c) Supervisory Appraisals, which is the selection of a candidate from within the institution from the appraisal of a manager; and (d) Interview, which is the final stage of the selection program. The article points out that to obtain better morale, all candidates should have an equal chance, and all should know the standards which are being used to evaluate candidates. The candidates should feel that the final judgment goes beyond the opinion of a supervisor, and, most important, they should see that those selected are actually superior. The author also discusses when to use written tests. The importance of development for new supervisors is emphasized.

Reading Improvement. The technical knowledge required of executives and managers today means that they must read vast amounts of trade magazines, current events magazines, and books, just as engineers, scientists, and other staff people must do to keep abreast

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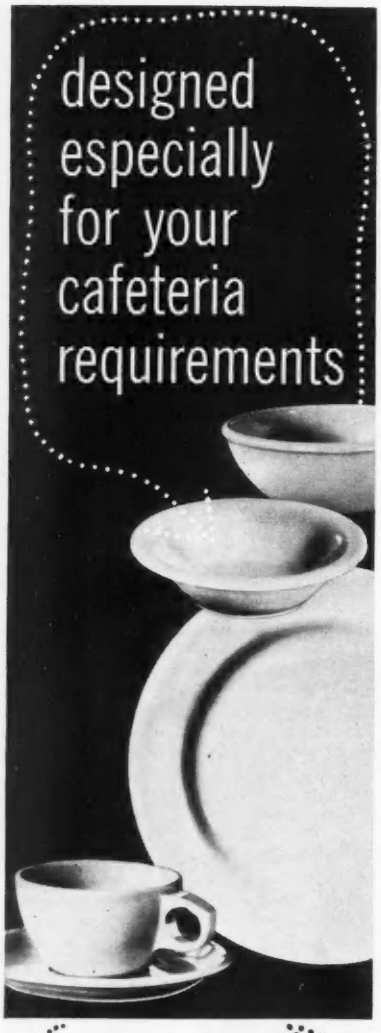

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of new trends, inventions, technical data, and current events. Extra reading, and the amount of extra time it involves outside of regular working hours, has started a trend in many institutions and businesses to offer courses for reading improvement, because faster reading leaves more time for routine work. It has been proved that everybody can read at least two or three times faster with good comprehension if given the right kind of help. This article surveys the training methods and objectives of reading courses—the "right kind of help" needed to improve speed and comprehension. The author says that a reading course has lasting effects, if it is taught correctly, if the students know how and why they are progressing, and if they have the right attitude about the course. The author also emphasizes, however, that the student must have continued practice and "follow-up" after the course ends.

Empathy in Personnel Management. The ability to empathize is one of the greatest assets a personnel manager can have and is a skill that pays great dividends, but also a skill that must be practiced and worked at. It is difficult to project oneself into another person's shoes, but that is exactly what must be done when coping with many of the problems that arise in personnel work. The ability to understand others' behavior actually depends greatly upon one's own behavior and experiences with others. For this reason, objectivity, appreciation of the rights of others, consideration for their pride, sensitiveness to the other person are all essential in the practice of empathy. It is conscious thinking that involves the heart as well as the mind. A personnel manager has to deal with false pride, unsympathetic interest, impatience, ridicule, sarcasm, and other similar attitudes. The personnel manager must discover what these attitudes are and deal with them objectively. There are no set rules for the practice of empathy, but this author suggests that one make attempts to do these four things: (a) determine all the circumstances surrounding the matter in question; (b) evaluate each of the possible subsequent effects of the action to be taken or statements to be made; (c) avoid rationalizations that would normally apply only to yourself and be as objective as possible; and (d) temper your conclusions and final decision with sympathetic understanding and customary courtesies.

PRACTICAL HOME ECONOMICS

Vol. 33, December, 1954

* How to make films work for you. V. Falconer.—p. 9.

Using Films. As visual aids become more and more a part of our educational system, the proper way to use a film in the classroom should be emphasized. One of the greatest drawbacks to the use of an instructive film is that many teachers have the idea that films are substitutes for teachers. This article points out the reasons a film should be used just as one would use a textbook, as an aid to the teacher, not to replace her. The article gives five basic steps to insure the most advantageous results from a film. They are: (a) prepare yourself, by knowing the film before you show it to the class, and don't expect to know what's in the film by the name of the title; (b) prepare your classroom, such as setting up equipment and arranging material, before the class is assembled; (c) prepare your class and tell them why you're showing the film and what to look for in it; (d) show the film and plan the entire period carefully for a good showing; and (e) follow up the film by applying and expanding the knowledge that was given. The article elaborates on these five basic steps.

RESTAURANT MANAGEMENT

Vol. 75, November, 1954

* New trends in food. N. Greene.—p. 16.
* How the Hot Shoppes train their waitresses. H. Palmer.—p. 36.
* Saving time and money in meat and vegetable preparation. A. W. Dana.—p. 42.

Roast-poaching cut-up turkey parts for more yield and profit. M. Batey.—p. 44.

* Seven ways in which a factory's cafeterias were improved. J. Joseph.—p. 50.

Featuring festive holiday dishes. A. Easton.—p. 53.

New Trends in Food. The University of California food technologists have developed a method of dehydrating meat so it can be stored on open shelves for two years. It is dehydrated under high vacuum and placed in an air tight container. Before cooking, the meat is simply soaked in water for a few minutes... A powdered milk product, which is easy to dissolve and is hard to tell from fresh milk, has been developed by the University of Wisconsin. The powder is made by drying homogenized milk at a temperature just above the freezing point... Waxy rice flour is being used for thickening frozen and canned precooked foods. It prevents the curdled look and the tendency of canned foods to become increasingly firm in storage... Last year Americans consumed per person, 223 lb. more foods such as meats, dairy products, fruits, and vegetables than they did in 1909. They ate 222 lb. less of grain products and potatoes per person.

Training Waitresses. A large restaurant chain conducts classes for hostesses, waitresses, assistant managers, and cooks to teach the food business to new and old employees. The following benefits have accrued to the company: (a) better service is given to customers; (b) higher quality food is served; (c) uniform procedures are maintained throughout the chain; (d) the company has versatile employees; and (e) good employee morale is achieved. On the first day of employment, waitresses are sent to "class," where they set up their own standards by answering the question, "What do you look for in a waitress?" They are then given forms explaining the company's rules and discuss them. They are given instruction on standing correctly, the use of different dishes, and personal appearance, such as hair styles, types of uniforms and shoes, and the care of these articles

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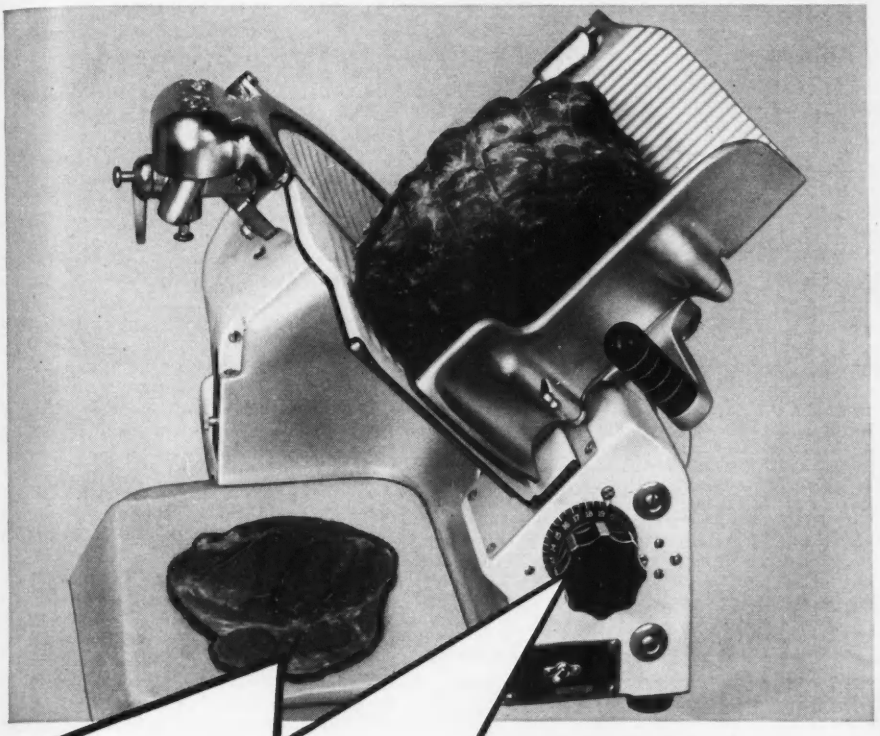

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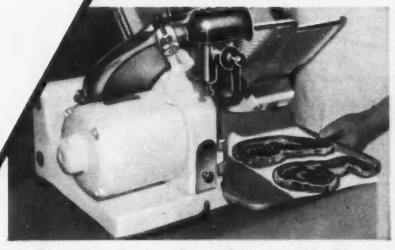

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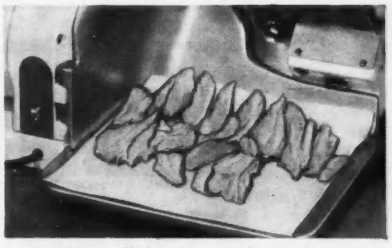
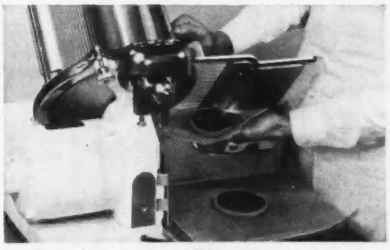


Turkey—Why serve lumpy, uneven hand-carved slices when Globe does it better and faster.



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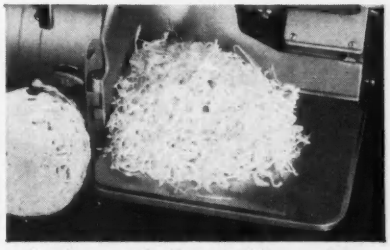

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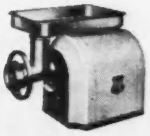

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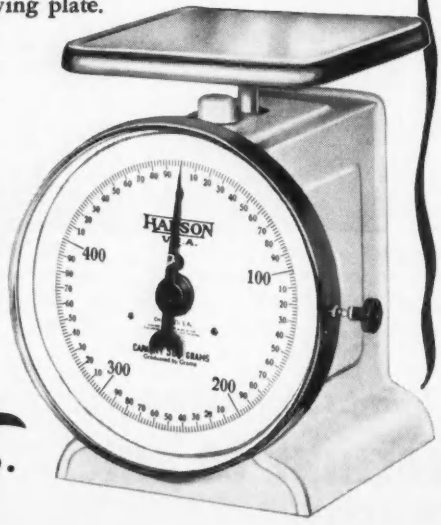


HANSON SCALE CO.
Est. 1888
Northbrook, Illinois

of clothing. Following class instruction, the waitresses receive on-the-job training, with each trainee assigned to a "sponsor" who has attended special classes to learn the techniques of training. The trainee follows and observes her sponsor and slowly works a station of her own. Cards are used for checking the trainee's progress and are carried by her as a reminder. Two daily menu drills are part of the everyday training of all waitresses on the job. Just prior to lunch and dinner, new menu items and food terminology are discussed and new dishes sampled. Another part of the program to maintain high standards of service is the "mystery guest," who, unknown to the girl, checks her performance in a program to select the "Waitress of the Week." To be effective, training must be continuous, varied, and interesting; there must be a system of constant follow-up, incentives, and inspections; and the program must have the complete backing of the management.

Vegetable and Meat Preparation. Convenient pieces of equipment, designed to speed and ease the job of vegetable preparation, are described. There is a root vegetable stand, which will accommodate sacks of root vegetables off the floor, and when placed near the vegetable peeler, sink, or table will aid in keeping the floor clean. Another item is a portable truck with rolled edge and a cut-out hole in one corner through which potato eyes can be disposed of into a garbage pail on the shelf below. (The shelf below can also serve as a foot rest.) Equipment for meat preparation is also discussed, including four basic requirements for an electric meat saw, the best method of grinding meat, and the advantages of a double-compartment sink for handling fish or poultry. These functions and pieces of equipment are planned so that meats and vegetables can be set down before and after processing, and preparation may be achieved with greater convenience, reduced hazards and fatigue, and easier cleaning up.

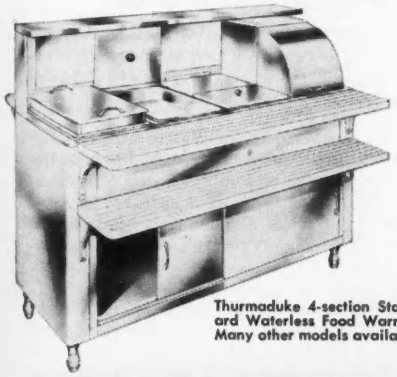
Seven Ways to Improve a Factory Cafeteria. Concern that fewer and fewer workers were eating in the factory cafeterias led to improvements. The concern was directed toward providing a place for relaxation and enjoyment. Seven points were found to need improvement. (a) The interiors were drab and dreary. This was improved with lighter colors, and the ceilings were enclosed. (b) Booths caused inability to seat more than 450 simultaneously. Tables replaced the booths and seating was increased by 100. (c) Untidy floors, another problem, were thus eliminated by removing the booths. (d) Another line for short orders and snacks was added to eliminate this lack. (e) Unpleasant clatter of dishes was eliminated by having self-bussing. (f) Unsightly exposed rafters were sealed in by cardboard. (g) Slow service was eliminated by taking out some unnecessary items from the steam table or counter and making four lines instead of one, each line specializing in one type of food, i.e., grill items, complete dinners, and à la carte orders.

for more efficient food service...

BETTER DO WHAT BOEING DID

Seven thousand people a day pass through this ultra-modern *Boeing Airplane Cafeteria* at Wichita, Kansas. The eight Thurmaduke Standard Unit Counters total more than 400 feet in length.

This efficient and beautiful set-up includes many exclusive Thurmaduke features designed to provide better tasting food at lower cost with less maintenance.



Thurmaduke 4-section Standard Waterless Food Warmer. Many other models available.

Whether you require a ten foot counter, a thousand foot counter, or a separate food warmer . . . you can do what Boeing did for more efficient food service. You can depend on Thurmaduke for unmatched engineering excellence backed by 51 years of manufacturing experience.

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Please send complete information on
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News Notes

Dr. Eliot Becomes Honorary A.D.A. Member. On December 13, Dr. Martha Eliot was made an honorary member of The American Dietetic Association by action of the Executive Board. Dr. Eliot is Chief of the Children's Bureau, Department of Health, Education, and Welfare, Washington, D.C. She is a graduate of Radcliffe College and the Johns Hopkins School of Medicine, where she received her M.D. She interned at St. Louis Children's Hospital and was later a resident in pediatrics at the New Haven Hospital. At Yale University, between 1921 and 1935, Dr. Eliot was an Instructor in the Pediatric Department, Assistant Clinical Professor, and Associate Professor. Since 1935 she has been an active lecturer at the University. In 1924, Dr. Eliot was appointed Director of the Division of Child and Maternal Health of the U.S. Department of Labor. In national and international health problems, Dr. Eliot has served as Vice-Chairman of the U.S. delegation to the International Health Conference in 1946, Chief Medical Consultant to the United Nations International Children's Emergency Fund in 1947, member of the U.S. delegation to the First World Health Assembly at Geneva in 1948, and Chairman of the Expert Committee on Maternal and Child Health of WHO in 1949. Among other associations, Dr. Eliot is a member of the American Academy of Pediatrics, the American Institute of Nutrition, American Pediatric Society, American Public Health Association, and the National Research Council.

Dr. Eliot has the distinction of being the first to be appointed to honorary membership since 1938 and of being the second woman to receive this honor, the first being Mary Swartz Rose, now deceased. Other honorary members of the Association are: Dr. E. V. McCollum, Dr. Malcolm MacEachern, Dr. A. L. Parsons, and Dr. H. C. Sherman.

Miss Bulman Honored. At the "Honors Night" dinner of the Association of Military Surgeons of the United States on December 1, Grace Bulman became the first recipient of the McLester Award for outstanding accomplishments in nutrition and dietetics. Miss Bulman was not only the first recipient of the Award, but was also the first woman to be so honored by the Association in its sixty-three years of existence. Miss Bulman received a $500 honorarium and a bronze plaque for her long years of outstanding service and accomplishment in the dietary care and nutritional betterment of the hundreds of thousands of Army, Navy, Marine, and Coast Guard veterans, who are patients in the 172 Veterans Administration hospitals she serves. Sponsor of the McLester Award is J. B. Roerig and Company, a Division of Chas. Pfizer & Co., Inc.

***Sodium-Restricted Diets* Published.** Now available is the new publication by the National Academy of Sciences-National Research Council, titled *Sodium-Restricted Diets*, which is a report of a special committee of the Food and Nutrition Board. Portions of this booklet, together with discussions of the thinking behind its recommendations, were published in the articles in the January issue of the JOURNAL by Paul A. Clifford and Corrine A. Robinson.

This comprehensive report on progress and developments in the use of sodium-restricted diets for therapeutic purposes includes chapters on: "Normal Physiology of Sodium Metabolism"; "The Use of Sodium-Restricted Diets in Disease States"; "Complications of Sodium Restriction and Contraindications to Its Use"; 'Planning Sodium-Restricted Diets"; "Sources of Sodium"; "Analytical Methods"; and "Salt Substitutes," as well as six tables on sodium and potassium content of foods, diets, and waters.

Copies are available from the Division of Biology and Agriculture, National Research Council, 2101 Constitution Avenue, N.W., Washington, D.C., for $1.00 each.

Plentiful Foods MONTHLY LIST

During February, the "featured" plentiful food will be eggs, according to an advance report from the U.S.D.A. The complete list of "plentifuls" follows:

Protein foods

Dairy products	Turkeys, heavy
Eggs	Shrimp
Haddock	Tuna, canned
Halibut	

Fruits and vegetables

Beans, canned green	Corn, canned sweet
Beans, dried	Grapefruit, fresh and processed
Lima, baby and large	Lettuce
Pinks	Raisins
Pintos	Oranges, fresh and processed
Carrots	

Other foods

Almonds
Lard
Rice
Vegetable fats and oils

Weight Control Colloquium. Ames was the setting of a "Weight Control Colloquium," sponsored by the Iowa State College on January 18 to 20. The purpose of the colloquium was to bring together people who have done outstanding work in problems related to weight control and to discuss the physiologic, biochemical, psychologic, and practical aspects of the problems. The colloquium was sponsored by the Divisions of Home Economics and Agriculture of the College. Those who attended the colloquium discussed and interpreted recent research on the subject in hope that it would lead to better understanding and knowledge of the problems throughout the country. The program was planned as follows:

Some Problems in Weight Control

Body Composition and Its Change with Age and Diet—Ancel Keys, University of Minnesota, Minneapolis

Regulation of Food Intake and the Multiple Etiology of Obesity—Jean Mayer, Harvard University, Boston

Aging as a Problem of Nutrition—Edward J. Stieglitz, Suburban Hospital, Washington, D.C.

Weight Problems among Children and Adults

Food Intake and Body Weight of Iowa Children—Ercel S. Eppright, Iowa State College, Ames

Deviations from Normal Weight in Children: Nutritional and Health Implications—Joseph A. Johnston, Henry Ford Hospital, Detroit

Factors Relating to Weight Control of Children—Genevieve Stearns, State University of Iowa, Iowa City

Energy Intake During Pregnancy—Helen Oldham, Agricultural Research Service, U.S.D.A., Washington, D.C.

Food Intake and Body Weight of Older Women—Pearl Swanson, Iowa State College, Ames

Weight Changes and Health of Men—Ancel Keys, University of Minnesota, Minneapolis

Weight Control Measures

Weight Control Propaganda—Ruth M. Leverton, Oklahoma A. and M. College, Stillwater

Weight Control through Nutritionally Adequate Diets—Margaret A. Ohlson, Michigan State College, East Lansing.

Helping the Overweight Individual—Charlotte M. Young, Cornell University, Ithaca, New York

Group Methods in Weight Reduction—William D. Simmons, California Department of Public Health, San Francisco

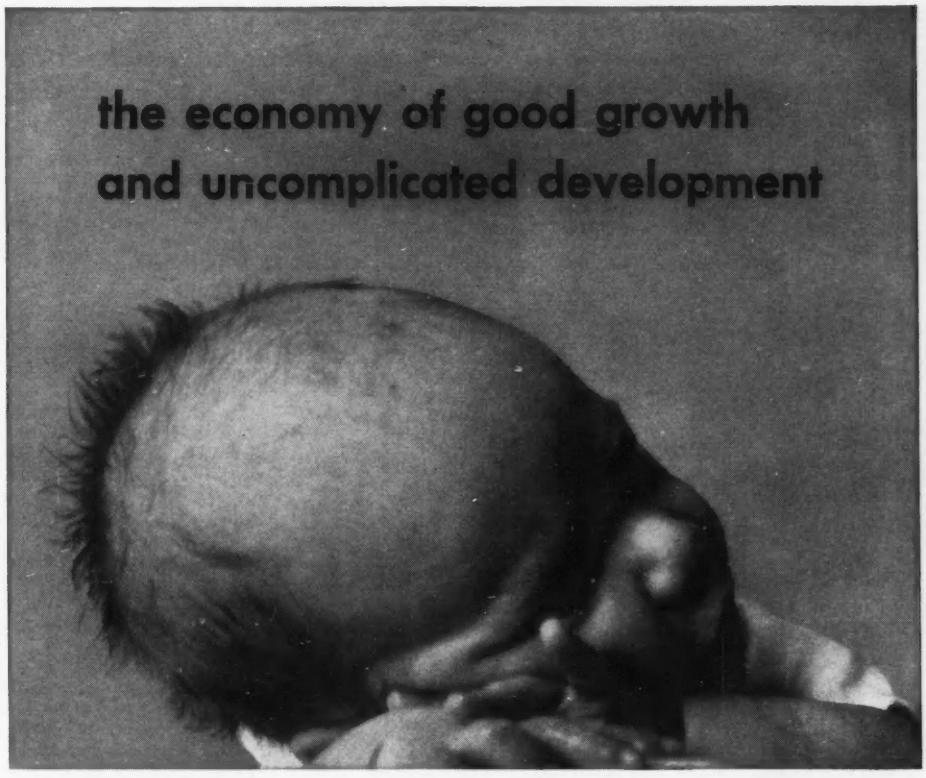
Psychological Aspects of Weight Reduction—Robert Suczek, Kaiser Foundation Hospital, East Oakland, California

The Role of the Physician in Weight Control—Daniel A. Glompset, Des Moines

Need for Weight Control Programs in the United States—James M. Hundley, U.S. Public Health Service

Who Should Reduce—a panel discussion led by Norman B. Nelson, State University of Iowa.

Home Economics Symposium. A symposium on "Potentialities of Women



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To assure sound growth and reduce many of the complications commonly encountered in the first year of life, the full, balanced Similac formula provides: fat, protein and carbohydrate closely approximating the content of human breast milk in quality and quantity; a full complement of known essential vitamins in adequate amounts; an adjusted mineral content; a soft, fluid curd with zero tension, assuring rapid and easy digestion.

SIMILAC POWDER—*stable in price . . . an economy in feeding*—

With food costs at or near an all-time high, the price of Similac has remained relatively constant since 1923. Similac with its complete modification and added vitamins is virtually the same in price as vitamin-supplemented whole-milk feeding – and in many instances actually affords greater economy.

SIMILAC *powder*

There is no closer equivalent to the milk of healthy, well-nourished mothers

SUPPLIED:
Tins of 1 lb., with measuring cup. Similac is also available as concentrated Liquid in tins of 13 fl. oz.

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INDIVIDUAL SERVICE

MELBA TOAST

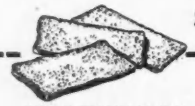
Containing only 17 calories per slice, tasty Old London Individual Service Melba Toast helps make reducing and other diets simple and effective for both you *and* your patients. Attractive, moisture-proof cellophane packaging keeps toast fresh and crisp . . . preserves that delicious nut-like flavor preferred by millions . . . eliminates the inconvenience caused by bread deprivation. Low 1⅓¢ cost per serving. Faster handling, lack of bottom-of-box breakage. No costly left-over waste. See for yourself why Old London *helps take their weight off your mind.* Send coupon for FREE SAMPLES today!

CALORIE CHART

Old London Melba Toast	17 Calories per slice
Roll or Bun	120 Calories
White Bread	65 Calories per slice
Rye Bread	55 Calories per slice

CHEMICAL ANALYSIS: (WHITE MELBA TOAST)

Moisture	3.23%
Ash	2.77%
Protein Nx 6.25	13.90%
Fat—Ether Extract	1.87%
Crude Fibre	0.60%
Carbohydrates by Difference	77.63%
Caloric Value per slice	17
Weight of average slice	4.5 grams



2 slices to package . . . 180 packages per caddy

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Please rush me, without obligation, FREE Samples and information about Old London Individual Service Melba Toast!

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in the Middle Years" will be held April 18–20 by the School of Home Economics, Michigan State College. The program, which will be part of the Centennial Celebration of the College, will emphasize the challenges evolving from the changing role of women in the middle years and the research findings related to these changes. Some of the distinguished leaders who will take part in the symposium are: Dr. Robert Havighurst, University of Chicago; Dean Frances Zuill, University of Wisconsin; and Dr. Pearl Swanson, Iowa State College. Ten other speakers will also participate in the physiologic, psychologic, sociologic, economic, and employment aspects of the problem.

Meetings. The National Health Council has announced that the *1955 National Health Forum*, to be held March 23 and 24 in New York City, will concern itself this year with "Forecasting America's Health." Dr. Roscoe P. Kandle, Deputy Commissioner of the New York City Department of Health, will serve as chairman. Sessions of the Forum will explore the nation's resources and forces for better health, and participants will try to establish guides along which the many groups interested in health may work together effectively. Programs may be obtained from the National Health Council, 1790 Broadway, New York 19.

The Medical Information Bureau of The New York Academy of Medicine will sponsor an *Eastern States Health Education Conference* on Thursday and Friday, April 21 and 22, at The New York Academy of Medicine in New York.

The second *Congress of the International Diabetes Federation* will be held July 4 to 8, 1955, in Cambridge, England, with the Secretary-General of the British Diabetic Association as host. There will be two sections of the Congress: one will be purely scientific for doctors and allied professions; the other for laymen, for discussion on social problems. Papers to be read at the convention will be in either English or French.

Continuation Course. This year the University of Minnesota will again offer a continuation course in clinical dietetics, March 3 to 5, inclusive. The course, under the direction of Gertrude Thomas, who is Director of Nutrition and Professor of Dietetics at the University, will cover recent advances in medicine and their relationship to the field of dietetics.

Symposium on Antimetabolites. On March 1, The National Vitamin Foundation, Inc., will sponsor a symposium on "The Antimetabolites—Their Modes of Action and Therapeutic Implications" at the Biltmore Hotel, New York City. The program has been announced as follows:

"Anti-Vitamin E Stress Factors as Related to Fatty Peroxides"—E. L. Hove, Alabama Polytechnic Institute, Auburn

"Thiamine Antagonists"—L. R. Cere-

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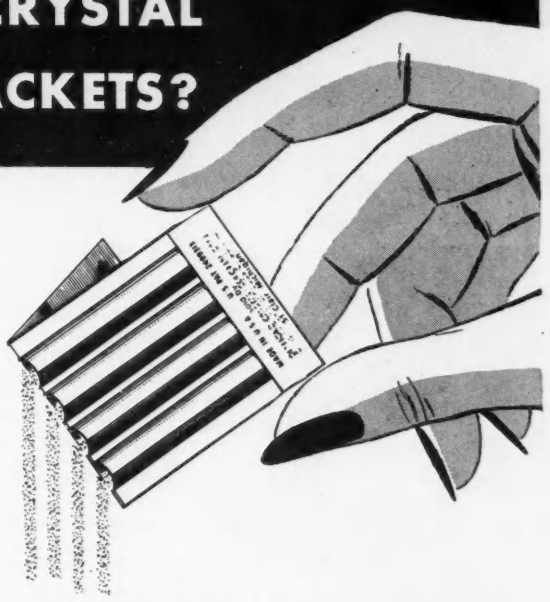

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- Prevent cross-infection because they are used by only one person and then thrown away!
- Save time and labor! Eliminate washing, filling and constant handling!
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Packets contain New Weather-pruf Salt which stays free-flowing even in wet or humid weather!

Each Packet contains enough salt and pepper for a complete meal!

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"In my experience no two calves —no matter how carefully bred— give the same yield per pound. No butcher—no matter how skilled— can cut every leg of veal so uniformly that I get the same number of portions each time."

"All of this adds up to lost portions—the portions I expected but never did get when I bought my veal by the pound."

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cedo, Fordham University, New York City

"Vitamin K Antagonists"—K. P. Link, University of Wisconsin, Madison

"Folic Acid Antagonists"—J. H. Burchenal, Memorial Center for Cancer and Allied Diseases, New York City

"Purine and Pyridmidine Antagonists"—G. H. Hitchings, The Wellcome Research Laboratories, Tuckahoe, New York

"A Naturally Occurring Antimetabolite of Methionine in the Causation of a Disease"—D. W. Woolley, The Rockefeller Institute for Medical Research, New York City

"Pantothenic Acid Antagonists"—O. D. Bird, Parke Davis & Company, Detroit

"Vitamin B_6 Antagonists"—W. W. Unbreit, Merck Institute for Therapeutic Research, Rahway, New Jersey

"Riboflavin Antagonists"—J. P. Lambooy, The University of Rochester, Rochester, New York

Goldberger Award Goes to Dr. Wilder. The Goldberger Award in Clinical Nutrition for 1954 was presented to Dr. Russell Wilder at a meeting of the Food and Nutrition Board on November 5. The award, which is sponsored by the American Medical Association through the Council on Foods and Nutrition, is presented each year to someone who has made significant accomplishments and has had sustained interest in nutrition. Dr. Wilder is best known for his studies of carbohydrate metabolism and diabetes mellitus. He was formerly Professor and Head of the Department of Medicine at the Mayo Clinic for many years, and as a member and executive of many scientific and professional organizations has influenced nutritional attitudes and policies in the medical profession and in the country as a whole. Dr. Wilder served as an editor of the *Archives of Internal Medicine* for twenty-one years and participated in the organization of the Food and Nutrition Board of the National Research Council in 1940.

Dietitian Promoted. The Board of Directors of The Progressive Farmer Company recently elected Sallie Fletcher Hill Vice-President of the corporation. Miss Hill, who is an associate member of A.D.A., has been Editor of the Home Department of *Progressive Farmer* for a number of years.

U.S.D.A. Poultry Regulations. The Poultry Division of the U.S.D.A. has proposed an amendment inserting descriptions of chicken parts in the Department's poultry regulations in order to provide standards for approving labeling for packs of poultry parts carrying U.S.D.A. inspection and grade marks. Except in the case of chicken breasts, the proposals are virtually the same as those which have been used in the past by the Poultry Division.

Food Acceptance Symposium. The military, along with food manufacturers, distributors, and sellers, have come to recognize the importance of measuring food acceptance. The people in these organizations also know that both science and technology are required to measure the acceptability of foods. Science provides the methodology, and technology performs the measurement service. However, two questions might be asked: "what science?" and "what technology?" There is neither a separate scientific discipline devoted to measurement of acceptance measuring, nor a university curriculum to train such technologists. Although pertinent source material is scattered throughout many periodicals, not one text book, handbook, or special journal has been created for the education of those interested in this field. Nevertheless, there has been progress in assaying food quality, and this progress indicates clearly that more precise, universally applicable methods of measurement are now needed. Because of this growing interest and need of facts, the Quartermaster Food and Container Institute for the Armed Forces sponsored a symposium in October 1953 on "Food Acceptance Testing Methodology." The recently published reports of this symposium is divided into two sections: "Panel Techniques" and "Consumer Preference Techniques." Copies are available on request from the Quartermaster Food and Container Institute for the Armed Forces, 1819 West Pershing Road, Chicago 9.

U.S.D.A. Films. The U. S. Department of Agriculture has released a catalog containing all the current films produced by the Department, as well as some that were produced by other Government agencies but which are distributed by the Department. The catalog gives instructions for using U.S.D.A. films effectively and handling the films so as to prevent damage. The films are distributed free of charge (other than transportation costs) by cooperating film libraries in forty-eight states, the District of Columbia, and the territories of Alaska, Puerto Rico, and Hawaii. Films are catalogued according to subject matter, and abstracts of all films are included.

Film on Shrimp Planned. The Fish and Wildlife Service of the U. S. Department of the Interior has announced the signing of a contract with the Peelers Company of New Orleans for the production of a new educational film on shrimp. The company, which manufactures machinery for peeling and deveining shrimp, will finance the film which will have a running time of 13 to 14 min. The film has been tentatively entitled "Shrimp Tips from New Orleans," and it will emphasize shrimp recipes characteristic of that part of the country. This information will be of value to homemakers and home economists, as well as to purchasers of shrimp and institutional users. The decision to produce such a film was reached because of the popularity of an earlier film, "Shrimp Please," which was released by the Fish and Wildlife Service in October, 1954. However, the new film will not duplicate any of the material in the first film. It will be released for distribution in about a year.

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NO MOTHER GOOSE FABLE -
THEY SET A SMART TABLE!

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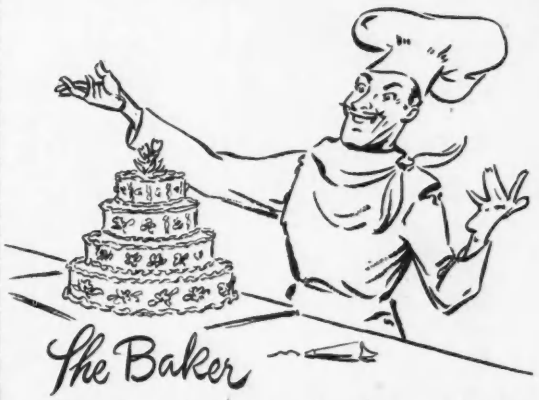
On 'most any menu, meat makes the meal,
Be it succulent roast or tenderest veal.
So rely on the Butcher; he knows how to buy
For profits, for portions, for quality high.



The Baker

Corn bread, sweet rolls, pies and cakes,
Everybody loves what the Baker makes.
Menus that feature his tasty attractions
Bring owner and guest complete satisfaction.

This Chinaware Maker

The baked goods and meat and the rest of the meal
Should be served in a "frame" that enhances appeal.
The frame that enhances and lasts long in use
Is the chinaware bearing the name Syracuse.

No other china can match Syracuse
In quality, beauty and widespread use.
No matter what manner of feeding you're in,
From hotel to diner to wayside inn,
Syracuse patterns and functional shapes
Match any decor, from rugs to drapes.
The choice and the value never were finer
In "open-stock" patterns of Syracuse China.
See your dealer today and you'll learn, too,
Why the best in china is best for you.

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Restaurant Industry Vocational Guidance Program. As part of its educational program, which is underwritten by H. J. Heinz Company, the National Restaurant Association has prepared an educational kit for vocational guidance counselors in high schools. Through this program, it is hoped that enough young people will be attracted to the industry to insure its progress during the next five years. Material in the kit was compiled by the staff of the National Restaurant Association, its Educational Committee, state and local restaurant association secretaries, and many leading restaurateurs and educators.

Part of the program, "The High School Career Counselor Newsletter," will periodically report happenings in the restaurant industry which may be of special interest to the vocational counselor. For example, the first issue provides information on scholarships for restaurant training, filmstrips, and the program of continuing education. The *Vocational Guidance Manual for the Food Service Industry*, which is included as part of the kit, was prepared for use as a source book. It explains the restaurant industry and opportunities for students with different educational and experience backgrounds. Also included in the kit is a smaller pamphlet, "Career Opportunities in the Foods Service Industry," outlining many of the qualifications for work in restaurants and the opportunities for advancement.

A fourth facet of the program is a full-color filmstrip on "Careers in the Restaurant Industry" which was prepared by Heinz and is available for loan. A script is available for use with the film.

As an additional incentive to make the program productive, the H. J. Heinz Company is offering a $1000 annual scholarship to a qualified high school graduate who wishes to further his education with college training in restaurant management.

Finer Flavored Applesauce. The Eastern Regional Research Laboratory of the U.S.D.A., working cooperatively with a commercial concern, has developed a process that will add better fresh-apple flavor to canned applesauce. The essence, which is made from the peels and cores of apples, was added to applesauce and was then tested by a taste panel. The test panel and consumer tasters preferred the sauce with the added essence and also liked sauce made slightly more tart with citric acid. The sauce with essence and citric acid added rated higher after nine month's storage than sauce without these additions. Because the problem of adding the essence to the sauce during processing has not yet to be solved, the applesauce is not yet on the market. Also it is not known whether consumers will pay slightly more for its more appetizing flavor. Products in which this type of processing is already used are certain jellies, candies, ice cream, and apple pies.

Army Personnel. The following changes in dietetic personnel of the Women's Medical Specialist Corps have been announced:

PROMOTIONS

2nd Lieutenant to 1st Lieutenant
Janice C. Arundel

1st Lieutenant to Captain
Eleanor A. Love
Julia A. Neale
Willa J. Neuwirth

SEPARATIONS

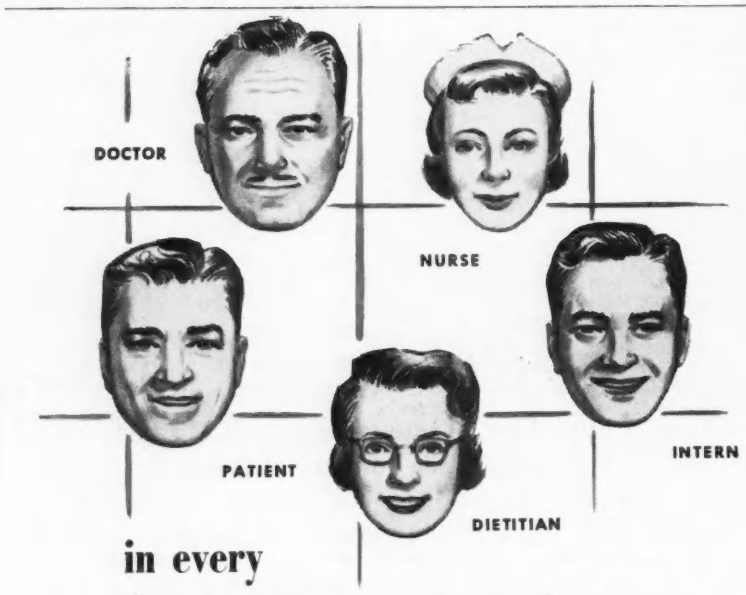
Regular Army Officer Honorably Discharged
Capt. Evelyn G. Mahoney

Reserve Officers Relieved from Active Duty
Capt. Maxine Armstrong
Capt. Beatrice Pearson
1st Lt. Barbara A. Bargen
1st Lt. Yvonne J. Chiolak
1st Lt. Ruth E. Gilbert
1st Lt. Luz E. Gutierrez
1st Lt. Julia J. Kula
1st Lt. Mary C. Rankin
1st Lt. Betty J. Sullivan
1st Lt. Teresa A. VanHulla
2nd Lt. Marilyn R. Angulo

RESERVE OFFICER ASSIGNED TO ACTIVE DUTY

Capt. Janet A. Hammill

New Zealand Diets. Of interest is the chart prepared by the New Zealand Department of Health, which outlines the recommended "Daily Dietary Pattern for New Zealand for Maori and Pakeha (white persons)." Rather than dividing food into seven groups, it



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More Coffee Flavor

There are many tastes to please in a hospital—nurses, patients, doctors, the administrative staff. In coffee *all* want FLAVOR. Millions enjoy Continental Coffee because it has the *most* in flavor—delicious, winey-rich, full-bodied and unvaringly fine—kept so by special Automatic Roasting Controls that maintain exact uniformity.

Continental's topnotch coffee service is so highly regarded that nearly 23,000 hospitals, restaurants, hotels, and other dining places prefer and serve Continental Coffee today! So for more coffee flavor and *better value* for *your* hospital, see your Continental Man... now!

For best results regardless of brand—always brew your coffee 2½ gallons to the pound

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AMERICA'S LEADING COFFEE for RESTAURANTS, HOTELS AND INSTITUTIONS
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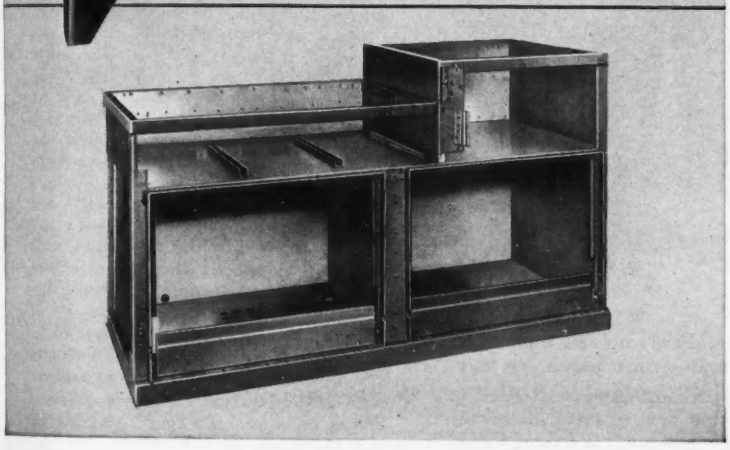
GARLAND FEATURES SUPER-STURDY ALL-WELD CONSTRUCTION!



Means Even Greater Strength, Makes Sagging Impossible in Famous Restaurant Range Line!

It's another first by Garland. Another step which makes the Garland line even more modern, super-sturdy, perfect for your needs. New Garland all-weld construction is standard on all restaurant models.

All-weld construction is a new precision method of welding the entire range body. This is a process comparable to that which gives such great strength and durability to aircraft and automobiles.

Count on maximum efficiency . . . steady, even, easily-controlled temperatures when cooking with a Garland. Count on maximum utility . . . broiling, baking, roasting, griddle frying all at one time if you wish. Count on the greatest dependability and length of service known to the industry.

Available in standard black-Japan finish, new Garland granite gray, or stainless steel. See your nearest food service equipment dealer or write us for information.

Count on a Garland Restaurant Range to help you make money. It will!

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DM PRODUCTS

Heavy Duty Ranges • Restaurant Ranges • Broiler-Roasters • Deep Fat Fryers
Broiler-Griddles • Roasting Ovens • Griddles • Counter Griddles • Dinette Ranges

PRODUCTS OF DETROIT-MICHIGAN STOVE CO., DETROIT 31, MICHIGAN
IN CANADA: GARLAND-BLODGETT LTD. — 1272 Castlefield Avenue, Toronto

presents twelve classifications of foods to be eaten each day, as follows: milk; cheese; eggs; meat, fish, or liver, etc.; potatoes or kumaras; vegetables; fruits; butter and fat; bread; cereals; iodized salt; and cod-liver oil. The chart is designed for posting on kitchen walls to help homemakers plan.

Eunice E. Fariss. The A.D.A. office has been informed of the death of Eunice E. Fariss on November 4 in Kansas City, Missouri. Miss Fariss had served as a dietitian at the Alexian Brothers Hospital, Chicago; Kadlee Hospital, Richland, Washington; Colorado State Hospital, Pueblo; and the Menorah Hospital in Kansas City. She had been an A.D.A. member since 1929.

News of State Associations

California Dietetic Association. A meeting of the *Bay Section* of the California Dietetic Association was held on November 8 at St. Luke's Hospital, San Francisco. The program for the evening was a discussion on "Inspection and Standardization of Processed Foods" by a representative of the U.S.D.A.

Connecticut Dietetic Association. The annual meeting of the Connecticut Dietetic Association was held on November 4 at the new Hotel Statler in Hartford. Some of the features of the program were: "The Thinking Behind the Kitchen Plan of the Hartford Statler," by Mildred Haugh, Director of Food Supervisors and Services, Hotels Statler, Inc.; and "Nutrition in the Orient," by Dr. William H. Adolph, Lecturer in Nutrition and Public Health, Yale University School of Medicine.

Florida Dietetic Association. The Florida Dietetic Association combined its annual meeting and an institute on November 3, 4, and 5 in St. Petersburg. The program included:

"Gerontology, America's New Problem"—Dr. Robert Rothermel, Pinellas County Health Department, St. Petersburg

"Kitchen Layout"—George Zipfel, General Manager, Food Service Equipment and Engineering Corporation, Tampa

"Still Cooking with Gas"—Dr. Donald Lundberg, Head, Hotel and Restaurant Management, Florida State University, Tallahassee

"Mealtime Is Variety Time"—a film narrated by J. P. Haager of Standard Brands, Tampa

"Psychology of Eating"—Dr. Paul Penningroth, Director, Mental Health Services, Florida Board of Health, Jacksonville

"Management Research in Food Service Operation"—Dr. Mary K. Bloetjes, Florida State University

"Current Status of Modified Diets"—Dr. A. H. Raynolds, Chief, Medical Service, VA Center, Bay Pines

"This Changing Economic World"—Dr. Charles Rovetta, Dean, School of Business, Florida State University

"Human Relations in Professional Activities"—J. M. Godard, Dean of Admissions, University of Miami

The *Tampa Dietetic Association*, in conjunction with the Dairy Council of Hillsborough and Pinellas Counties, has compiled a three-page leaflet entitled "Calorie Conscious Party Foods." The leaflet features foods that will not be a challenge to a guest's "will power," but will still be delicious. Included are helpful suggestions under these sections: "Do's and Don't's," "Nibbling Foods," "Drinks," "Treacherous Calories," and "Mainstays" (foods that cut down craving for sweets). In the "Toppings and Dressings" section, there are recipes for cottage cheese topping, whipped dry milk, and a prize salad dressing.

Louisiana Dietetic Association. The dietitians in Alexandria were hostesses to the Louisiana Dietetic Association at its annual meeting November 12 and 13. Talks on selective menus for patients, cost accounting, and the dietitian's role in civil defense were included in the program. Some of the speakers were: Frances Halbert, Hotel Dieu, New Orleans; Dr. Daniel M. Kingsley, Orthopedic Surgeon from Alexandria; Lillian Nelson, Oscher Foundation Hospital, New Orleans; Lester E. Johnson, Assistant Administrator of the Baptist Hospital, Alexandria; Florine C. Allen, Director of Dietetics, Southern Baptist Hospital, New Orleans; Marion Porch, Louisiana Civil Defense Agency, Baton

STEAM-CHEF *LIKE MAGIC IN ANY KITCHEN!*

For puddings, vegetables, meats, fish or fowl, there's no real mystery in food preparation with *Steam-Chef* or Steamcraft—it just seems that way.

Steam cooking is indispensable for more appetizing menus . . . Food is cooked "just right" with the steady, penetrating heat of steam. It makes all foods look better—taste better. It preserves the natural colors, flavor and juices, and reduces shrinkage unbelievably.

The *Steam-Chef* or Steamcraft Way is economical too, cooks up to 50 servings for 1¢. It reduces food spoilage and left-overs—eliminates scorching and scouring of pots and pans. Many foods can be cooked in serving pans ready for transfer to serving tables—kitchen help is freed for other duties.

Get all the time and money-saving facts about *Steam-Chef (heavy-duty)* and Steamcraft (for smaller kitchens). Available for direct steam, gas or electric operation—Sizes and styles to fill your requirements, write to:

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THINK YOUR CHEF WOULD BELIEVE US...

if we were to say he can make as rich-tasting a whipped salad with milk as he can with expensive whipping cream?

CARNATION'S BETTER-BLENDING AND DOUBLE-RICH QUALITIES ARE THE SECRET— NO OTHER FORM OF MILK WILL DO!

You might say *richer*-tasting! For Carnation not only whips, but also has special blending qualities not found in cream. And these qualities bring out more of the flavor of the other ingredients in the salad, as well as a smoothness not possible with any other form of milk.

Carnation's special blending qualities and double-richness make it the ideal milk for *all* cooking and baking. Fine cooks everywhere are discovering this — and we hope to welcome *your* chef into the Carnation fold soon. In the meantime, why not suggest to him that he try Carnation in this whipped salad — just as a "starter"?

Takes only *one* can of Carnation
... *small* can, at that!

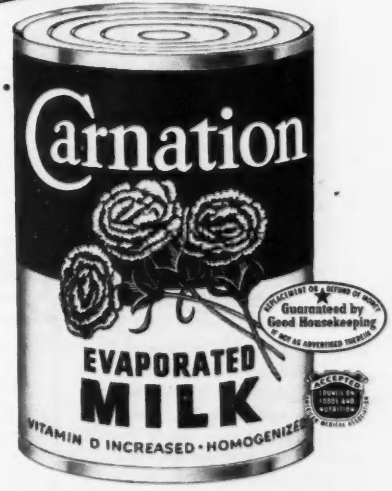
FESTIVAL FRUIT SALAD

(Makes 6-8 Servings)

- 1 package lime or lemon-flavored fruit gelatin
- ⅔ cup hot pineapple juice
- ⅓ cup hot water
- 1 cup well-drained canned pineapple chunks
- ¼ cup chopped nuts
- 2 tablespoons chopped maraschino cherries
- ¼ teaspoon salt
- 1 cup unpeeled chopped apples
- ⅔ cup (small can) *undiluted* CARNATION EVAPORATED MILK
- 2 tablespoons lemon juice

Dissolve gelatin in hot pineapple juice and water. Chill until thickened and syrupy (about 20 minutes). Combine pineapple, nuts, cherries, salt and apples in bowl; stir into thickened gelatin. *To whip Carnation,* chill Carnation in refrigerator tray until soft crystals form around edge of tray (about 10-15 minutes). Whip chilled Carnation until stiff, add lemon juice and continue whipping until *very* stiff. Fold whipped Carnation into fruit and gelatin mixture. Chill in mold or loaf pan until firm (about 2 hours).

FOR QUANTITY RECIPES, write to Mary Blake, Carnation Company, Dept. C-25, Los Angeles 36, Calif.



"from Contented Cows"

Rouge; Dr. John Hunter, Registrar, Louisiana State University, Baton Rouge; Mary Ruth Curfman, Chief Dietitian, Prudential Life Insurance Company, Houston; and Beth Andrews, Assistant Professor, Louisiana State University. Clara Zempel, representative of The American Dietetic Association, brought the members up-to-date on the happenings in the Association office.

New officers of the *New Orleans Dietetic Association* are: President, Annette Longino Moore; President-Elect, Lorraine Bursley; Treasurer, Miriam Harris; and Secretary, Kathryn McMahon Berkemer.

Maine Dietetic Association. The fall meeting of the Maine Dietetic Association was held at the University of Maine, Orono, on November 13. Reports of the delegates to the New Hampshire Food Workshop, to the Simmons College Nutrition Conference, and to the A.D.A. Annual Meeting in Philadelphia were given. Dr. Mary M. Clayton, Nutritionist at the Agricultural Experiment Station of the University, spoke on "Findings for Maine from the Northeastern Regional Nutritional Project."

Officers for the Association for 1954–55 are: President, Dorothy L. Woodcock, Department of Health and Welfare, Augusta; President-Elect, Charlotte Peirce, Goodall Memorial Hospital, Sanford; Secretary, Gertrude Chapman, VA Center, Togus; and Treasurer, Dorothy A. Cole, Nasson College, Springvale.

Appetites Need Tempting?
Budgets Need Cutting?

LET MAGGI DO IT!

The meal-planner's best friend! . . . Anywhere meal-planning is a problem, Maggi's Granulated Bouillon and Maggi's Seasoning can be a big, BIG help.

Coaxes out hidden flavor! . . . Maggi's Seasoning is a highly concentrated cooking aid that multiplies and emphasizes the natural taste of food. Makes meats, casseroles, gravies, stews taste marvelous! Maggi's Granulated Bouillon Cubes dissolve instantly, add appetizing, meaty flavor.

Economical, easy to use! . . . Naturally, Maggi's cooking aids make low cost dishes taste better . . . transform leftovers into treats, all in a few seconds time! So keep these world-famous products—Maggi's Seasoning and Maggi's Granulated Bouillon Cubes—always on hand!

Let MAGGI aid in special diets, too!

Maggi's Seasoning and Maggi's Granulated Bouillon Cubes are high in protein, low in calories. Extremely easy to digest . . . even more digestible than simple foods such as toast. (Not recommended for salt-free diets.)

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VALUABLE FOOD PLANNING TIPS!
Quantity recipes for delicious soups, stews, meat dishes!

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Oregon Dietetic Association. The Oregon Dietetic Association met on December 4 at the University of Oregon Medical School, Portland. Dr. Arthur Scott, Reed College, discussed radioactive iodine, and Dr. Zolton Wirtschafter, VA Hospital, Portland, spoke on psychodietetics. Maurine Neuberger, State Representative, reported recent trends in legislation at the luncheon. Other speakers were Dr. Gordon Grace, U.S. Public Health Service, whose topic was infectious hepatitis, and Frank Parcher, Oregon State Emergency Welfare Officer, who discussed civil defense.

South Dakota Dietetic Association. The fifth annual meeting of the South Dakota Dietetic Association was held on November 9 and 10 in Aberdeen. Some of the speakers and their subjects were:

Loretta Mundt, high school counselor—"Fostering Careers in High School Students"

Dr. P. G. Bunker—"Food Allergies"

Sister Conception, Education Director of the Presentation School of Nursing—"Report on Revision of Dietary Clinical Experience"

Sister Mary Alma, St. Joseph Hospital—"Psychological Appeal of Attractive Trays"

Dr. Frances M. Hettler, Home Economics Division, South Dakota State College—"Problems in Recruitment"

Virginia Dietetic Association. On November 12 and 13, the Virginia Dietetic Association met in Charlottesville. Featured speeches included:

"The Social and Scientific Background for the Recommended Dietary Allowances"—Dr. LeRoy Voris, Executive Secretary, Food and Nutrition Board, Washington, D.C.

"Emergency Mass Feeding"—Helen Ward, Virginia School Lunch Program, Richmond

"Sanitation in Food Service"—J. Farrar Pace, Virginia Health Department, Richmond

"The Role of Fat in Body Composition"—Dr. Grover C. Pitts, University of Virginia Medical School, Charlottesville

Officers for 1954–55 of the Virginia Association are: President, Julia VanHorn, University of Virginia Hospital, Charlottesville; President-Elect, Kathryn Smith, Reynolds Metals Company, Richmond; Secretary, Dorothy Rowe, Madison College, Harrisonburg; and Treasurer, Sally Ann Ellison, Richmond.

Washington State Dietetic Association. November 12 and 13 were the dates of the annual convention of the Washington State Dietetic Association held in Seattle. Featured at the first session was a panel discussion on "Research in Dietary Design" headed by Isola Robinson, Dietetics Specialist of the American Hospital Association, Chicago. Other features of the convention were: "Discussion of the Problem of Fluoridation," a debate with Dr. Stanley

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COLOR-and-PATTERN HARMONY

in LAMINATED TRAYS

COLOR is the magic ingredient that cheers a room, brightens spirits, and provides the proper setting for foods! And the easiest, least expensive way of adding color is with BOLTA'S COLOR TRAYS! 36 superb combinations to match table tops or counters or to contrast with drapes and furniture. An elegant, "no-expense-spared" look for your room or restaurant is yours for only a few cents more per tray. And the trays more than repay that extra cost with years of extra wear!

Only BOLTA gives you such outstanding durability in patterns and colors.

- Non-porous, satin-smooth surfaces
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- Will not warp, split or stain
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Also Famous Boltalite Hard Rubber Trays in Sizes 12x16 and 14x18
Also Boltabilt Trays in Round, Oblong and Oval Shapes in 15 Different Sizes

The BOLTA *Company*
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MASSACHUSETTS

Planning to Re-decorate? Specify **BOLTAFLEX** ***for booths and furniture,*** **BOLTA-WALL** ***for interiors***

Zahler of the University of Washington taking the affirmative, and Dr. Frederick Exner, Radiologist, taking the negative; "Kittitas County Community Program on Weight Control," by Evelyn Boggs Rapp, Kittitas County Extension Agent; and "Newer Developments in Food Processing and Packaging," a round table discussion with four participants.

The *Seattle Dietetic Association* held its December meeting at the Virginia Mason Hospital Nurses Home on December 2. Mrs. E. Stewart Carter, a well known flower arranger and garden club enthusiast, was the featured speaker. She spoke on Christmas decorations and demonstrated the making of wreaths and swags, tin-can decorations, and buffet arrangements of greens and cones. The money from an auction of "white elephants," gayly wrapped for Christmas and sold "sight unseen," was added to the scholarship fund. In January the group met at Harborview for a tour of the new facilities and a talk by Mary Northrop. The meeting on February 3 featured Wallis Graves of the National Bank of Commerce, who spoke on "Investments for Professional Women."

Association Activities

Representatives. Alice Cromartie, President of the Florida Dietetic Association, was the A.D.A. representative at the *American School Food Service Association* meeting which was held in Miami, November 15 to 20, 1954.

Dr. Margaret A. Ohlson will represent A.D.A. at a Centennial Symposium entitled "Nutrition in Plants, Animals, and Man," February 14 to 16, at *Michigan State College*. The School of Agriculture will sponsor this commemorative event. Dr. Ohlson is also representing the Association at ceremonies commemorating the one-hundredth anniversary of Michigan State College.

New A.D.A. Affiliation. The American Dietetic Association has been accepted for membership in The American Committee on Maternal Welfare, Inc. This Committee includes most organizations interested in maternal welfare, such as the American Academy of Obstetrics and Gynecology, American Hospital Association, American College of Surgeons, American Nurses Association, American Public Health Association, U.S. Public Health Service, and U.S. Children's Bureau. The Association will continue to cooperate with this group in the establishment of standards in maternal welfare.

A.D.A. Representation. Twenty-eight different meetings and events of allied organizations were attended by official representatives of our Association during 1953–54. These events were mentioned during the past year in this column.

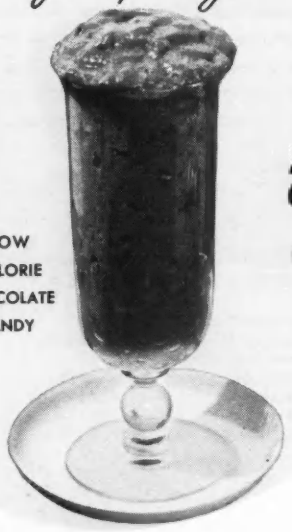
Library Activities. The A.D.A. Library Committee, with Elizabeth Tuft as Chairman, met on December 15 and again on January 12 to review periodicals from related fields for the purpose of selecting articles from them to be placed in the Lulu G. Graves Memorial Library.

News of Products and Services

The *G. S. Blakeslee & Co.*, manufacturer of commercial dishwashing machines, is celebrating its seventy-fifth year of business during 1955. The company is the oldest manufacturer of commercial dishwashing machines. One of the most famous of the early models was described by *Hotel World* in an editorial in 1894 as a "formidable looking affair with timber enough in it to build a good sized barn." This particular machine operated on the same principle as the street sprinkler and consisted mainly of a large water tank from which water sprayed when a valve was released. Dishes were locked in a basket which revolved by means of a hand crank. Quite in contrast are the new 1955 models which will incorporate new eye appeal and advanced engineering features.

To accommodate the many foods which can be steam-cooked in pans and placed directly on serving tables, *Cleveland Range Company* has designed a new model Steam-Chef built to handle six or twelve standard 12 by 20 in. cafeteria pans. It can also handle standard steam-

Perfect party dessert for dieters



LOW CALORIE CHOCOLATE DANDY

Tall, sweet, and beautiful

(and only 34 calories per serving)*

It only *looks* too good to be true. Not a bit of sugar in it, but it's sweet, SUCARYL-sweet—and a lot kinder to the waistline. SUCARYL, you know, cooks and bakes right in with foods, sweetens like a charm (without adding calories)—and it won't turn bitter on you. One trial will prove the point.

Low Calorie Chocolate Dandy

1 envelope unflavored gelatine
2 teaspoons Sucaryl solution or 16 Sucaryl tablets, crushed
½ cup cold water
3 tablespoons cocoa
½ cup cold water
2 eggs, separated
2 teaspoons cornstarch
½ cup cold water
1 teaspoon vanilla

*109 calories if made with sugar.

Mix gelatine, SUCARYL and ½ cup cold water in top of double boiler; dissolve over hot water. Add ½ cup cold water to cocoa; stir well. Beat egg yolks; add cocoa mixture; blend well; add to gelatine mixture; stir well. Cook 3 to 4 minutes over hot water. Remove; measure; add enough cold water to make 2 cups. Blend cornstarch with last ½ cup cold water; bring to boil over low heat; add to chocolate mixture; add vanilla. Chill until mixture mounds slightly when dropped from spoon. Whip with rotary egg beater until frothy. Whip egg whites stiff; fold in. Chill until firm. Spoon into dessert glasses. Makes 6 servings.

...make it yourself with **Sucaryl®**

(*Cyclamate, Abbott*)

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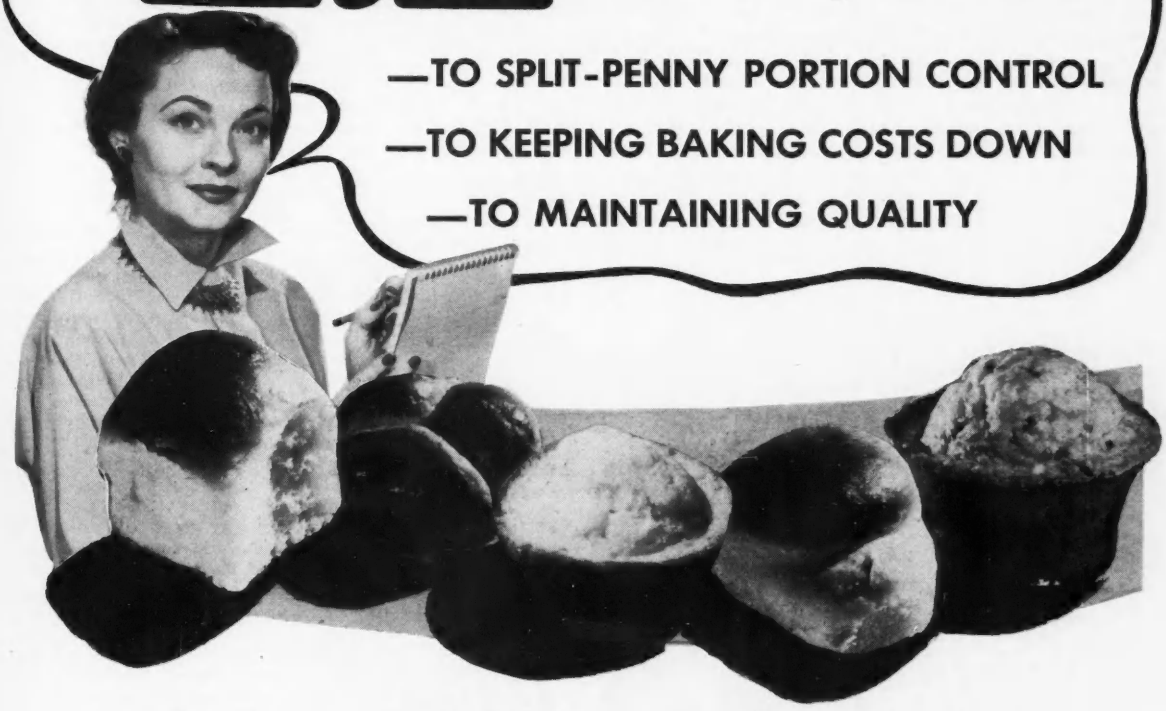
Downyflake is my answer



—TO SPLIT-PENNY PORTION CONTROL

—TO KEEPING BAKING COSTS DOWN

—TO MAINTAINING QUALITY

—and it's so EASY to make Variety HOT BREADS with Downyflake

With Downyflake, the dietician knows her costs . . . knows they're *right*. Knows she can depend on her source of supply and quality, 100%.

Downyflake Prepared Baking Mixes help her baker produce more . . . at less cost . . . allow him more time for finishing. Even unskilled help can turn out "home baked" quality and goodness in gingerbread, corn muffins, bran muffins, hot rolls.

Simple!—only one ingredient to keep track of. "Just add water . . . mix and bake."

Over a third of a century's experience . . . skillful blending . . . the best ingredients money can buy . . . all combine to give Downyflake that superb texture, flavor and deliciousness. Downyflake baked goods add a taste-thrill to meals . . . spark appetites.

Why not send for a sample? . . . See for yourself how Downyflake is the answer to your baking needs!

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ing baskets when desired. Using such equipment can reduce materially the handling and cleaning of pots and pans and prevent damage to foods such as asparagus and broccoli. The company has prepared a bulletin titled "For Better Steaming" which discusses the use of steam cooking and its advantages.

Sunkist Growers, after extensive research on frozen concentrated orange juice, has developed a product called orange serum agar, which is a dehydrated culture medium containing orange juice serum. This medium furnishes essential vitamins and other organic growth factors necessary for the development of bacterial strains ordinarily difficult to cultivate. The growth factors in orange juice, long recognized as essential in human nutrition, have proved to be dramatically successful in improving the detection of bacteria, yeast, and molds. The researchers who processed this medium used blood plasma equipment, and several years' testing by researchers in universities and experiment stations show that orange serum agar contains trace nutrients that make it versatile in the examination of many difficult laboratory problems.

For use in bussing dishes and general carrying, *Metropolitan Wire Goods Corporation* is offering a new basket coated with double heat-treated plastisol to protect the glass or china. The new basket replaces a similar one with wood slats to protect the china. The new design has wood runners on the bottom to protect the plastisol coating against excessive abrasion. As optional equipment, at no extra cost, it can be had with metal runners. The plastisol coating also reduces noise.

Metropolitan has also developed a glass drainer with plastisol coating which will reduce operational noises. This type of drainer is particularly desirable in counter operations and is of the same type of material as that used in dishwashing machine racks.

The *Pacific Coast Canned Pear Service* has inaugurated publication of *Pearadise News*. Pear recipes, designed for quantity food operators, will be featured as well as menu combinations.

The *Coffee Brewing Institute, Inc.* has issued a color, sound-slide film titled "Specialty of the House," designed for use in employee training to teach correct methods of producing coffee, both with urn and vacuum-type equipment. The film, plus the accompanying recording, is available for $5 plus mailing and handling charges. A companion piece for the film has also been prepared in the form of a spiral-bound booklet by the same title. In it, the individual frames of the film are reproduced, together with applicable copy.

Another recent activity of the *Coffee Brewing Institute* has been a Consumer Preference Survey to learn customers' wants and desires concerning coffee. In New York, Chicago, and Los Angeles, 2400 customers in eight basic types of restaurant operations have been questioned. Preliminary results indicate that people regard flavor as the most important factor in good coffee, followed by strength, aroma, and color. Forty-three per cent of those questioned said that better flavor and taste were what they liked about good coffee, while 38 per cent felt that strong, richer, full-bodied, and better-brewed coffee was important. Poor coffee was characterized as "weak," "watery," "tasteless," "flat," "stale," "bitter," "burnt," "smokey," and "just plain lousy." Coffee apparently has great influence in patrons' choice of places to eat. According to this survey, 49 per cent ranked coffee at the top of the food items which are important in selecting a restaurant. It was superceded only by cleanliness (84 per cent) and courteous service (64 per cent). That the quality of brew served is correlated to the success of a restaurant operation was also indicated by the fact that 49 per cent said they visited a given restaurant often specifically because it served good coffee, while 33 per cent had stopped going to another establishment because the coffee was not up to par.

Authorization to use the National Sanitation Foundation's "Seal of Approval" on its soda fountain and luncheonette equipment has been received by the *S. & R. Soda Fountain Manufacturing Co.* This equipment has been approved as fulfilling Sanitary Standard Requirements #1.

The Educational Department of the *Kraft Foods Company* has published an interesting illustrated booklet entitled *The World of Cheese*. The booklet is di-

"Just a bug he picked up somewhere*..."

*Health authorities say only one dish in ten washed by hand is "safe".

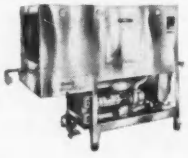
KEEP THEM HEALTHY WITH COLT AUTOSAN DISHWASHERS!

WHEN YOU EXPECT high grades and full-time attendance from a youngster, you owe it to him to help keep him physically fit.

Protect him from "unsafe" dishes with *sanitizing* Colt Autosan Dishwashing Equipment! Every step in the Colt dishwashing process contributes to cleaner *sanitary* dishes—from contamination-free automatic pre-flush, through exclusive "cloudburst action" wash, to 180° sanitizing rinse.

Durable Colt-engineered Autosans are economical to operate. Many have been in daily use for over 25 years! Write for complete information. COLT'S MANUFACTURING COMPANY, Dept. D-2, Hartford 15, Conn.

COLT AUTOSAN DISHWASHER
MODEL RC-30 (2400 dishes per hour)
New design based on research in scores of kitchens. New wash chamber door gives easy access to interior, simplifies tube and scrap tray removal and cleaning. New wash spray distribution concentrates spray, increases washing efficiency, improves splash control. Requires only limited floor space. Also available without pre-flush.



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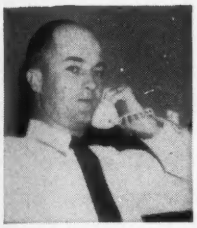
DISHWASHING, SANITIZING, DRYING MACHINES, and VEGETABLE PEELERS
MADE BY THE MAKERS OF FAMOUS COLT HANDGUNS, INDUSTRIAL PACKAGING EQUIPMENT, AND MOLDED PLASTIC PRODUCTS

IN DALLAS,

THEY ALL COOK WITH

GAS



"Gas is my dependable partner in the restaurant business. I wouldn't change to any other cooking fuel," says Carl W. Brown, owner of Brownie's Restaurant in Dallas. "Modern Gas equipment produces quality food at minimum cost and results in greater profits. Furthermore, Gas . . . with its wide range of available temperatures . . . provides greater flexibility and is fast and clean. Gas is *the* modern cooking fuel."

Restaurants, hotels, clubs, cafeterias, schools, hospitals, and every other type of dining place from coast to coast find Gas the key to efficient cooking. It brings out the goodness and appetizing appearance of food. It's the most economical approach to good commercial cooking.

Wherever food is finest, it's cooked with Gas. Your Gas Company Representative will be glad to discuss the economies and results Modern Gas Equipment can provide. *American Gas Association.*

RESTAURANTS

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Basil's Restaurant
Beck's Fried Chicken
Belmont Restaurant
Brass Rail Restaurant
Brockles Restaurant
Bryan's Smoke House
Brownie's Restaurant
Casa Linda Restaurant
Chantly's Sea Food
Chicken Shack
Dobbs House Air Port Restaurant
Dolly Madison Tea Room
Eatwell Restaurant
El Chico Restaurant (4)
El Fenix Restaurant (2)
Emmett's Restaurant
Golden Pheasant
Heard's Restaurant
Italian Village Restaurant
Jay's Marine Grill
Jumbo Restaurant (2)
Loma Alto Restaurant
Lou Ann's
Lucas' B & B Restaurant
Maurice's Restaurant
Mexico City Cafe
Old Warsaw Restaurant
Oriental Restaurant
Parrino Spaghetti Restaurant
Pig 'n Whistle Restaurant
Pulley Bone Restaurant
Royal Grill
Sammy's Restaurant (5)
Semos Restaurant
Shanghai Restaurant
Sivil's Drive In
Smorgasbord
Strattin's Restaurant
Torch
Town & Country Restaurant
Webb Waffle Shop (4)

CAFETERIAS

Dunton's Cafeterias (4)
Highland Park Cafeteria
Luby's Cafeteria (7)
Wyatt's Deluxe Cafeterias (8)
Fidelity Union Cafeteria

HOTELS

Adolphus Hotel
Dallas Hotel
Stoneleigh Hotel
Hotel Travis
Baker Hotel
Melrose Hotel
White Plaza Hotel
Statler Hotel
(Under Construction—will be Gas)

CLUBS

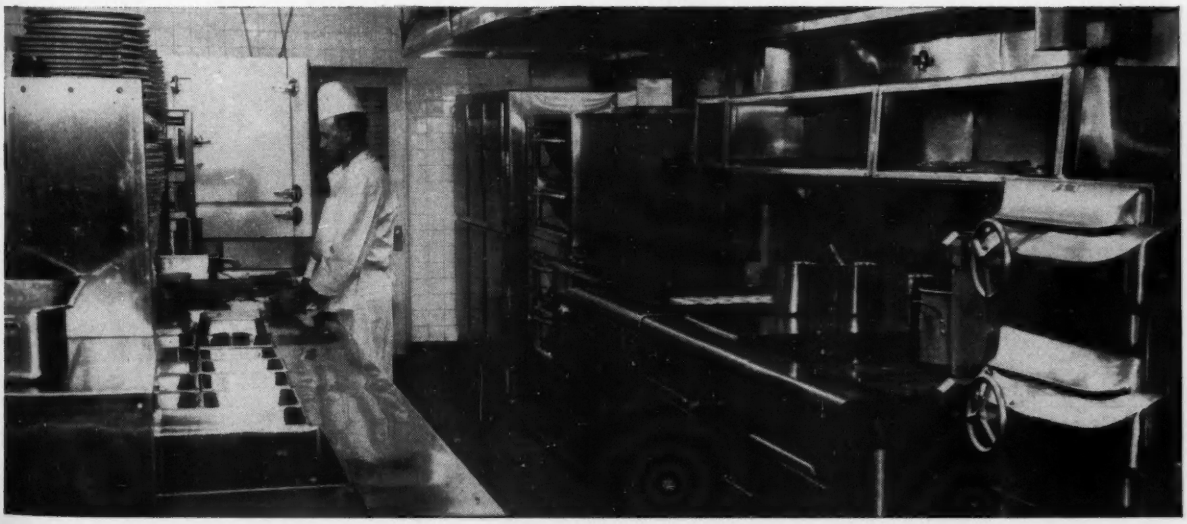
Dallas Athletic Club
Engineers Club
Lakewood Country Club
Oak Cliff Country Club
River Valley Country Club
Cipango Club
Dallas Petroleum Club
Dallas Athletic Golf & Country Club
Down Town Club
Dallas Country Club
Northwood Country Club
Preston Hollow Country Club
Spring Valley Athletic Club
Columbian Club
Greater Dallas Club

SCHOOLS

Southern Methodist University
Ursuline Academy
All Public Schools, which includes Park City Schools

HOSPITALS

Dallas Methodist Hospital
Baylor Hospital
Saint Paul Hospital
City-County Hospital
Medical Arts Hospital



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vided into five chapters: "Cheese Through the Ages," "Cheese on the Table," "The World's Favorite Cheeses," "Nutritional Value of Cheese," and "Quick Facts and Tips about Cheese," which contains data on standards for cheesemaking, successful cheese cookery, and care of cheese. This booklet, which is actually a guide to the world's favorite cheeses, will be of interest to both the connoisseur and the student.

Universal Industries has introduced a new peel trap base as an accessory which converts any portable Univex peeler into a floor model or permanent installation. This peel trap base is made of heavy stainless steel, satin finish, with adjustable stainless legs to accommodate different sink heights.

Dry or moist hot food storage is now available in two new counter units developed by *Seco Company, Inc.* These one-piece, stainless steel wells have the standard 12 by 20 in. openings, and each well is individually controlled to provide either dry or moist uniform heat concentration around the food. Both one-opening and two-opening standard sizes are available, and each well has an individual "on-off" thermostatically controlled switch and red pilot light.

The *Victory Metal Manufacturing Corporation* has released data on its Sta-Kold Model Refrigerator. The refrigerator—of all metal construction, the front part stainless steel and the top, sides, back, and interior of corrosion-resistant aluminum—features exclusive interchangeable interiors which are adjustable on 1-in. centers to take any combination of bakers' pan slides, stationary or pullout meat rails, stationary or pullout shelves, or refrigerated drawers. The capacity of the refrigerator is 40 cu. ft. Measurements are: width, 50¼ in., depth, 33½ in., height, 72¾ in. This model is available for pass-through layouts. It is complete with a ⅓ h.p. hermetically sealed unit, and has die-cast handles on all doors.

Precision Equipment Co. has produced an extra-heavy duty stock-handling cart which will handle loads up to 600 lb. The cart is on rubber-tired wheels which are stationary in front and swivel in the rear. The cart has two shelves, each 4 in. deep, which may be inverted so that the top provides a flat surface.

Richard H. Pass, President, *Onondaga Pottery Company*, recently received an honorary degree of Doctor of Laws from Alfred University, at ceremonies celebrating that institution's 119th anniversary. Mr. Pass has been affiliated with Onondaga since 1915, when he began work as a laboratory worker for the company. He is also President of Pass & Seymour.

Cereal Institute, Inc., has announced that the 2nd Annual Cereal and Milk Spring Festival will be held April 11 through 16. During this week, milk dealers and breakfast cereal companies will jointly promote both products "as making a good food team." Plans are also under way for a similar promotion week, September 11 through 17, to tie in with National Better Breakfast Month which has been designated for several years as September.

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